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A MANUAL FOR ACCREDITED SCHOOLS

DESIGNED FOR THE

TRAINING OF TEACHERS

FOR THE

IOWA PUBLIC SCHOOLS.

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IOWA PUBLIC SCHOOLS.

BY THE

EDUCATIONAL BOARD OF EXAMINERS.

1903.

ISSUED BY THE DEPARTMENT OF PUBLIC INSTRUCTION.

RICHARD C. BARRETT,
Superintendent Public Instruction.

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LIST OF APPROVED SCHOOLS.

Buena Vista College, Normal Department	Storm Lake, Iowa
The Academy of Cornell College	Mount Vernon, Iowa
Cedar Valley Seminary	Osage, Iowa
Denison Normal and Business College	Denison, Iowa
Decorah Institute	Decorah, Iowa
Normal College of Drake University	Des Moines, Iowa
Epworth Seminary	Epworth, Iowa
Normal Department of Ellsworth College	Iowa Falls, Iowa
Highland Park College	Des Moines Iowa
Lenox College	Hopkinton, Iowa
Simpson College	Indianola, Iowa
Tobin College	Fort Dodge, Iowa
Normal School Upper Iowa University	Fayette, Iowa
Western Union College	Le Mars, Iowa
Woodbine Normal School	Woodbine, Iowa
Western Normal College	Shenandoah, Iowa

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PREFACE.

The motive which prompts the issuance of this "Manual for Accredited Schools," is to put in definite form the conditions under which schools may become accredited, and to establish a standard of requirement of graduates of these schools when they wish to become applicants for Two Year State Certificates. No attempt has been made to furnish an outline for the class-room. The aim has been to classify the subject-matter upon which the applicant will be examined. To the end that definite, practical results will follow from the provisions of this new law, the Board of Examiners offers this manual for the guidance of those in charge of accredited schools.

THE LAW.

Chapter 115, Acts of the Twenty-ninth General Assembly.

Be it enacted by the General Assembly of the State of Iowa:

Section 1. Educational examiners to inspect and supervise. That the state board of educational examiners shall constitute a board for the inspection, recognition and supervision of the schools designed for the instruction and training of teachers for the common schools.

Sec. 2. Accredited schools—annual visitation. That schools desiring state recognition shall apply to the board of educational examiners which shall then proceed to inspect such schools with reference to course of study, equipment and faculty. All schools that shall meet the requirements of the board of educational examiners shall be known as accredited schools. Such schools shall have an annual visitation by some member of the board of educational examiners, or some one appointed for that purpose by said board, who shall receive compensation as is provided for in section 2634 of the code.

Sec. 3. Certificates—fee. Graduates of approved accredited schools who shall pass the required examination for a two years' certificate shall receive from the state board of examiners a certificate for two years, which may be renewed under such rules as said board may prescribe. Applicants for a certificate shall pay a fee of $2.00, one-half of which shall be returned in case of failure.

Sec. 4. Sworn statement. At the close of each school year, the principal or superintendent of each accredited school shall file with the board of examiners a sworn statement, showing the name, age, postoffice address, studies and attendance of each of the students in his school taking the prescribed teachers' course.

GENERAL REGULATIONS.

QUALIFICATIONS FOR ENTRANCE.

AGE. No person under fifteen years of age will be permitted to enter the teachers' course in accredited schools.

SCHOLARSHIP. As a qualification for entrance to the teachers' training course, it is required that students shall have completed a course of study equivalent at least to that given in the Hand-Book for Iowa Schools for the first eight grades.

INSPECTION OF FACULTY AND EQUIPMENT.

The law requires an inspection by the board of examiners in equipment and faculty of all schools wishing approval. In order that there may be some degree of uniformity, the board has fixed the minimum standard as follows:

(1) The faculty shall consist of at least five members, two of whom may be teachers of special branches. Teachers shall be graduates of the state university, state normal school, or other institutions having equivalent courses, or be the holders of licenses issued by the state board of educational examiners, except two-year state certificates.

(2) Buildings and grounds are to be devoted to school purposes only.

(3) At least two laboratories—physical and biological—shall be provided. The apparatus shall include such as is proper for use in giving instruction in physics, botany, physiology, physiography and history, together with necessary models to illustrate the various subjects taught.

(4) The library shall consist of at least one thousand volumes, exclusive of public documents; it shall contain the list named in this manual or the equivalent. In special cases where the library is of a character and type especially appropriate, five hundred volumes may be accepted provisionally. In every case it is expected that standard reference works treating of studies required in the course of study, and suitable modern apparatus, including maps and charts, will be provided.

REQUIRED OF GRADUATES.

Only graduates of the teachers' training course in accredited schools will be eligible to take the examination for the Two Year State Certificate.

APPLICATION FOR STATE RECOGNITION.

To the State Board of Educational Examiners:

You are respectfully requested to inspect....., with a view to having the same given state recognition for the training of teachers.

For the year ending June 30, 190....., the faculty will consist of the following named persons: (Give names of at least five teachers who will give instruction in prescribed course.)

1. Name..... . Graduate of what institution

.....

NOTE—If not a graduate, state in place whether person named holds a state license to teach.

2. Number of buildings devoted exclusively to school purposes.....

3. Number and kind of laboratories.....

.....

4. Apparatus in use .....

.....

5. Number of volumes in library, exclusive of public documents .....

.....

Character of same .....

.....

Give list of standard reference works in use .....

.....

6. What probable number of students, if any, do you expect will enter upon the prescribed teachers' course during the year beginning September 190 .. ? .....

Signed, ...

Principal or President.

Dated ..... 190.....

MINIMUM COURSE OF STUDY.

	FIRST TERM	SECOND TERM	THIRD TERM
	Grammar	Grammar	Grammar
	Orthog. & Word Study	Physiology	Physiography
1st yr.	Arithmetic	Arithmetic	Arithmetic
	Geography	Geography	History
	Reading	Penmanship	Vocal Music

Talks on Didactics three times a week.

	Algebra	Algebra	Algebra
	History	Bookkeeping	Elem. Psychology
2d yr.	Eng. Composition	Literature	Elem. Rhetoric
	Civics of Iowa	Civics U. S.	Economics
	Vocal Music	Drawing	Reading

Talks on Didactics three times a week.

	Physics	Physics	Physics
	School Management	Sch'l Manag't	Prim. Methods
3d yr.	General History	General History	Botany
	Drawing	Geometry	Geometry

It is expected that there will be drills throughout the entire course in spelling and penmanship.

By "term" is meant a period of twelve weeks.

A MORE EXTENDED COURSE.

	FIRST TERM	SECOND TERM	THIRD TERM
	Arithmetic	Arithmetic	Arithmetic
	Grammar	Grammar	Grammar
1st yr.	Geography	Geography	U. S. History
	Penmanship	Penmanship	Drawing
	Reading	Reading	Orthography
	U. S. History	Civics of Iowa	Civics U. S.
	English	English	English
2d yr.	Physiography	Physiology	Nature Study
	Talks on School Management	Talks on Methods of Teaching	Prim. Methods
	Music	Music & Drawing	Drawing
	Algebra	Algebra	Algebra
	Gen'l History	Gen'l History	Gen'l History
3d yr.	Bookkeeping	Bookkeeping ½	Botany
	English	Botany ½	English
	Drawing	Drawing & Music	Music
	Physics	Physics	Physics
	Reviews of Common Branches	Geometry	Geometry
4th yr.	Economics	Economics	Reviews of Com. Branch's
	Didactics	Didactics	Didactics
	Practice Teaching	Practice Teach'g	Prac'e Teach'g

ORTHOGRAPHY.

The value of this outline, like all other outlines, will depend largely upon the use made of it. To create a greater interest in the study of orthography, a brief history of the English language should precede its analysis. This will lead the pupil to see the beauty of the English language as a whole, and at the same time give a desire for correct spelling, the most important thing to be attained in the study of orthography.

Teachers should consider carefully the subject of spelling, and note the emphasis given to it in the pages immediately following the outline of the History of the English Language.

THE HISTORY OF THE ENGLISH LANGUAGE.

I. **The origin of language.**
   1. Necessity of speech.
   2. Theories of its origin.
   3. The earliest known languages.

II. **The families of languages.**
   1. The Semitic.
      (1) Chief divisions.
   2. Indo-European.
      (1) Chief divisions.

III. **Rise of English language.**
   1. Early England.
      (1) The Celts.
      (2) The Romans in England.
      (3) The Angles and Saxons.
      (4) The Danes.
      (5) The Norman-French.
   2. The fusing of these elements.
   3. Growth of the language.
      (1) Education.
      (2) Commerce.
      (3) Science.
      (4) Invention.

IV. **Chief elements of English language.**
   1. The Anglo-Saxon.
      (1) Characteristics.
      (2) Extent.
   2. The classical.
      (1) Sources.
      (2) Extent.

ORTHOGRAPHY AND ORTHOEPY.

I. **Definitions.** See any good text.
Certain definitions are absolutely essential.
They must be learned and *used*.

II. **Elementary sounds.**
1. Definition.
2. List of elementary sounds.
3. Classification.
   (1) Vowel sounds or vocals.
   (2) Consonant sounds.
      a. Subvocal sounds.
      b. Aspirate sounds.
   (3) Cognate sounds.
4. Formation of elementary sounds.
   (1) Labials.
   (2) Dentals.
   (3) Linguals.
   (4) Palatals.
   Give illustrations, classify many sounds, and see that relation of name to sound is clearly understood.
5. Combination.
   (1) Diphthongs.
      a. There are but two diphthongal sounds.
   (2) Digraphs.
      a. There are twenty-four digraphs.
   (3) Double consonants.

III. **Letters.**
1. Vowels.
   (1) Let pupils make lists of words from memory illustrating various vowel sounds.
2. Consonants.
   (1) Subvocal letters.
   (2) Aspirate letters.
   (3) Cognate letters.
3. Forms of letters.
   (1) Capitals.
      a. Rules for capitals reviewed and applied.
   (2) Small letters.
4. Diacritical marking.
   (1) Names of marks.
   (2) Use of marks.
   (3) Give much practice here in marking and spelling typical words.
   (4) The pupil must now begin to parse words.

IV. Words.

1. Origin.
   - (1) Primitive.
   - (2) Derivative.

   By intelligent drill, see that these divisions are understood. Use dictionary constantly.
2. Kinds, definitions.
   - (1) Simple.
   - (2) Compound.
   - (3) Synonym.
   - (4) Homonym.
   - (5) Antonym.
   - (6) Paronym.
3. Syllabication.
   - (1) English method—advantages.
   - (2) American method—advantages.
   - (3) Monosyllable.
   - (4) Dissyllable.
   - (5) Polysyllable.
4. Pronunciation.
   - (1) Articulation.
   - (2) Enunciation.
   - (3) Accent.
   - (4) Unaccented vowels.
   - (5) Rules for pronunciation.
   - (6) Use of silent letters.
   - (7) Use of dictionary.

   Many teachers are unable to use the dictionary to the best advantage, simply because they do not know how. Master it and encourage its constant use.
5. Spelling.
   - (1) By sound.
   - (2) By letter.
     - a. Oral spelling.
     - b. Written spelling.
   - (3) Rules.

   Spelling should receive much attention throughout the entire course.
6. Word analysis.
   - (1) Precede this work by a review and further study of the history of the language.
   - (2) Parts of words, as root, prefix, suffix.
   - (3) Steps in analysis.
     - a. Classify according to form, origin, syllables.
     - b. Give primitive parts, with meaning.
     - c. Give meaning of entire work.

THE TEACHING OF SPELLING.

Good results in spelling are absolutely impossible unless teacher and pupils feel the importance of it. How many pupils fail to enter the high school on account of their inability to spell? Too many times high school teachers feel that the grade teachers are alone responsible for the spelling. Too many times higher institutions feel that the secondary schools are entirely responsible for the spelling, and poor spellers are constantly graduating. Does not every teacher have some responsibility for the correct English of his pupils?

The poor speller that gets into the high school should be made to feel that this defect in his scholarship must be corrected at once. He should be required to begin this task without delay even though other branches have to be deferred. The teacher should seek to have his pupils take pride in the absolute accuracy of their work. Pupils should strive to have every word that they use correct as to meaning, pronunciation, and form.

The *Western Teacher* recently gave some facts full of interest touching the spelling of high school pupils. A teacher selected a list of a hundred words from primers and first readers. This list was given to many high schools as a test. In no school did seventy-five per cent of the pupils make a perfect grade. In many schools less than fifty per cent were able to make such a grade. This is the list:

to	red	flower	hoped
two	read	ant	hopped
too	pail	aunt	where
here	pale	blue	robin
hear	nose	blew	rabbit
see	knows	would	wagon
sea	tale	wood	running
four	tail	haul	water
fore	there	hall	swimming
so	their	fare	which
sew	deer	fair	seem
sow	dear	meet	stopping
by	no	meat	until
buy	know	hour	write

of	new	our	right
off	knew	rains	lamb
I	sale	reins	many
eye	sail	fly's	through
son	bear	flies	threw
sun	bare	bow	rode
any	led	bough	road
ate	lead	boys	rowed
eight	pain	boy's	limb
sum	pane	rose	Wednesday
some	flour	rows	February

These words should be given in phrases or in sentences.

The results mentioned in the above test show plainly that a pupil's spoken vocabulary is often much larger than his written vocabulary. Such tests should be carried on through all the grades. Words should be selected from all the text-books that the pupil uses. From such exercises the pupil learns much more than the particular words pronounced. He learns to observe closely, to see words as they are, and to note the correct use of words. It is a very useful exercise to place a list of words upon the board each week for the pupils to master. The list should not be too long. Twenty or thirty may be a fair average. These lists should be selected from words that the pupils would be likely to use. The spelling, pronunciation, and meaning of the words should be mastered. One test should be the ability of the pupils to use the words correctly in sentences. The other words that the pupils must use in the construction of the sentences are a great aid in learning to spell. This exercise carried on through a year gives a pupil a greatly increased vocabulary, carried on through a series of years gives a pupil a large vocabulary.

Too frequently pupils fail to make the most of their text-books because they have not mastered the words in them and possibly take no pride in doing this. If pupils know that at stated intervals they will be required to take tests in spelling from the books that they are constantly using, they will cultivate the habit of accuracy from close observation. Here is an illustrative list of words that pupils are using frequently in the seventh and eighth grades:

calendar	vegetation	impersonal
miscellaneous	manufactories	derivative
apothecaries	equator	apostrophe
eighteenth	parallel	petroleum

longitude
multiple
denominator
promiscuous
mercantile
salary
annual
definition
circumference
antecedent
consequent
principal
principle
decimal
infinitive
participle
subjective
longitude
latitude
agriculture
peninsula
superintendent
treasurer
sheriff
coroner
temperature
plateau
manufacturing
equinoctial
hemispheres
continental
detritus
atmospheric
artesian
terraces
inclination
alluvium
axis
capricorn
equatorial
participial
abbreviated
interrogative
auxiliaries
apposition
possessive
analyzing
potential
subordinate
predicate
attribute
transitive
imperative
complement
concessive
causal
gas
antarctic
monsoon
cyclones
savagery
drainage
alligators
monkeys
gorges
glacial
capitol
capital
territories
tobacco
commerce
industrial
governor
legislature
judicial
bureau
executive
secretary
diameter
sediment
beach
equinox
boundaries

Geographical names should be added to this list when pupils are pursuing the study of geography. When pupils study the names of the townships of their own county, should they not be able to spell them all? Should pupils not be able to spell the names of the counties, rivers, and chief towns of their own states? Some of these names should be included in the test.

The teacher who assumes that his pupils can spell the words that have been given in these lists will find himself mistaken if he gives a test. There should be some required standard in spelling for admission into the high school, and all other schools. There should also be some definite standard in spelling before graduation. Tests in spelling should be a part of the regular work of any high school and these should be continued to the very close. Teachers of English, especially, should give emphasis to this part of the work.

Suppose the class has studied two popular American classics, "Rip Van Winkle," and "The Legend of Sleepy Hollow." After these stories have been studied as literature, the plots, characters,

and the settings have been considered and the beauty of the rhetoric has been pointed out, let it be understood that the pupils must also pass a test in spelling. The result will be that the pupils will read the selections with more attention to individual words, they will look up many words, they will get a better understanding of many sentences. The words that they will learn to spell will be but a part of the benefit to be derived from the exercise. They will form the habit of studying words. Here is a list taken from the two selections:

fairy
latticed
siege
fiery
village
galligaskins
breeches
preceding
amphitheater
dominie
beverage
robbed
rheumatism
tripped
connubial
phlegm
haranguing
recollections
descendant
politician
tranquillity
reverie
propensity
improvement
Connecticut
birch
inapplicable
conning
potentates
tough
consolatory
revenue
maintenance
whilom
psalmody
spinning

perambulations
Hessian
skimmed
squadron
pattern
gobbling
chivalrous
wagon
piazza
accompanying
Herculean
rantipole
whirligigs
querulous
cruller
pyramid
sequestered
pertinacious
antiquity
Great Britain
martial
termagant
pigeons
antique
transient
incomprehensible
jerkins
naturally
disappeared
squirrel
sassafras
grieved
metamorphosed
Babylonish
doling
neighborhood

revolutionary
tyranny
wizard
legendary
migration
incessant
embarrassment
running
authoritative
conscientious
discrimination
chastisement
holiday
anaconda
grievous
magnanimously
harbinger
ghastly
galloping
stomacher
unwieldy
turkeys
pedagogue
gizzard
imagination
Tennessee
spinning
caprices
occurred
whimsical
viciousness
nipped
queued
tethered
coquettish
melancholy

If the class takes up the "Blithedale Romance," it will soon come across such words as these:

anemones
epitome
delectable
mendacious
apertures
dissimilitude
millennium
rhythm
clairvoyant
inexpressibly
effeminacy
scythe
ceremonial
communitarians
anomaly
exuberance
Pantisocracy
unserviceable
cannel

Some of these words may be difficult for high school pupils. They can be mastered by work and it is a good thing for pupils and teachers to understand that it takes work to become a good English scholar.

Teachers should be exceedingly careful to mark all misspelled words that appear in the manuscripts of their pupils. Much has been accomplished when pupils take pride in having every word exactly right. In two examination papers that have equal merit in technical knowledge, the teacher should always make a distinction in favor of the paper that has no misspelled words.

Frequent dictation exercises to be written on the blackboard do much to improve pupils in spelling. The spelling book may have a place in many high schools. The teacher must realize that there is much more to do than simply to pronounce words and to grade the papers. Every lesson should call out some discussion as to the meaning and use of words. The teacher should be a constant inspiration to pupils to strive after excellence in the work.

The rule for dropping the final "e" and the rule for doubling the final consonant should be thoroughly taught and exemplified. Many who consider themselves good spellers make mistakes in this kind of derivatives.

Along with the practical work of spelling there are several kindred subjects that should receive attention. These subjects are the classification of the letters, the ordinary diacritical marks, the classification of words, the growth of language, and the history of the English language. How much of this should be taught in connection with reading, composition, grammar,

and actual spelling exercises depends upon circumstances. A wide field of inquiry and study is here opened and pupils should be encouraged to enter it.

READING.

The mere calling of printed words is not reading. It is only when the reader gets the thought which words convey that he reads. We often think without making our thoughts known to others by speaking, and so we often read a page without speaking the words. Getting the thought without expressing it, is silent reading. Getting the thought and expressing it so that others may understand it, is oral reading.

A reader cannot properly express a thought which he does not have in his own mind, so a good oral reader must first be a good silent reader. There are many persons who cannot read, and yet they can think and talk. All the books and papers with their true and beautiful stories, mean nothing to them, because they have not learned the printed forms of words.

This outline is intended to be suggestive only. It contains a method of causing pupils to get the thought from the printed page, and to express it in such a manner that the hearer will understand. This, the author, believes to be the real object of oral reading.

OUTLINE.

I. **Preparatory to the reading lesson proper.**

1. Author's life and circumstances under which selection was written.
2. If selection is a cutting, study of the whole for setting.
3. If historical, discussion of events, bearing upon selection.
4. Side lights furnished by supplementary reading from history or literature that will add to the interest and vividness of selection and present it in its true setting.

NOTE—The best of literature should be selected for study in order to cultivate a love and appreciation for good literature. The supplementary reading should be assigned to different pupils to report upon.

II. How to study the reading lesson.

1. Read selection as a whole to get general idea.
2. Use the dictionary for the pronunciation and meaning, present and original, of unfamiliar words.
3. Supplementary reading for setting.
4. Read selection again for definite pictures.
   (1) Of characters—physical and mental characteristics.
   (2) Of scenes, places described, etc.
5. Read aloud to give to others what has been obtained from printed pages.

NOTE—The first two outlines are to be suggestive rather than lessons. The first to suggest how the lesson can be made most interesting and profitable in the class-room. The second to suggest to the students how to study any lesson.

III. Thought conception.

1. Relation of thought values.
   (1) Making the points in each separate thought stand out clearly.
   (2) Relating to the subordination of thoughts which should be subordinated and making prominent the thoughts which should be prominent. Selection to be used, Fizziwig's Ball.

NOTE—To be brought out by clear comprehensive questions and explanations by the teacher. A question for thought values often brings a response to thought and secures stronger expression.

2. Emphasis and tone.
   (1) Take the sentence, "Yes, he's nice," for work, giving it with different thoughts back of the words.
      a. Show first that he is nice but others of his family, or people of whom you have been speaking, are not.
      b. Show that he is nice but that there is a reservation and you do not approve of him notwithstanding his good qualities.
      c. Show that you think he is nice without any reservation.
      d. Show that you are willing to admit that he is nice but that you do not wish to commit yourself fully.
      e. Take other words and phrases, supplying different motives for their presentation. Examples: "Yes," "Good morning," "I think so," "John said he would go," etc.
3. Apprehension and comprehension of thought.
   (1) Training of eye to grasp thought from printed page readily.
   (2) Of mind to hold the thought while giving it orally.
   (3) Of voice to give the intellectual tone color to the words which only comes with full realization of what they mean.

4. Illustrative drill on words and phrases, showing the difference between giving them with tone color, or suggesting this meaning in the voice, and without. Examples for practice work: Cold, bleak, warm, strong, one hundred years old, dangerous illness, light as a feather, a good man, etc., illustrated by teacher, and then class drill and individual drill.
5. Mechanical aids to clear conception.
   (1) Punctuation as an aid to mental grasp of author's thoughts.
   (2) Errors in teaching punctuation as an aid to oral interpretation.
   (3) Time. The difference between "rhetorical pauses" and taking time to get the author's thought in all its fullness and giving the class time to get one thought from reader before being carried on to the next.
   (4) Value of the suggestiveness of hearing good readers read.
   (5) Bad results of imitation in reading.

IV. Picture work.

1. Out of sense materials—hills, roads, scenes, etc.—which class have seen to construct the pictures set forth in selection.
2. From experience in real life or through the imagination to see the situations and action of selection.
   Selection—Summer Storm.
3. From characters in real life, books and imagination to construct characters in selection and respond to them.
   (1) Physical characteristics.
   (2) Mental characteristics.
   Selection—Pickwickians Take a Drive.
4. To form ideal sounds, listen to them and respond to them.
   (1) Recalling sound from memory.
   (2) Forming purely ideal sounds from imagination.
   Selection—Organ music.

In connection with this might be given some voice work, using the resonant syllables mōn, mōn, mīne on different pitches, taking teacher's voice for ideal at first. Careful formations with the lips to be observed to bring the voice forward and round the tones. Other syllables, such as "lo," "ring," "no," etc., may be used in the same way.

V. Directing thoughts to class.

1. Forgetfulness of self in message.
2. Directing thoughts to some one, first to teacher or class-mate, in a natural, conversational style.
3. Carrying it further and including the whole class.
   Selection—Dinner at the Cratchett's.

NOTE—This step is intended to insure the pupil against affectation and absurdities of speech and bring simplicity and directness.

4. By pupil's will to command the attention of the class.
   (1) To be accomplished by imagining situations that would be an incentive—that he is the orator on a great occasion—that the class are children who must be entertained, etc.
   Selection—The Revelation of a Stone.
5. To accomplish the purpose of the author and produce the effects upon the listeners' minds that the author intended to be produced in the minds of his readers.
   Selection—Toussaint L'Ouverture.

VI. Life. Response to thought in body.

1. Illustrated by teacher taking a sentence at a time and giving it with life and without.
2. Drill work with class taking a sentence at a time and giving it with life and without.
3. Work with individuals the same way.
   Examples: "Go!" "Halt!" "Down with the traitor!"
4. Vigor. Carrying the preceding suggestions further. The emotions to be more strongly aroused and the will transferring emotions and pictures to hearers. Life providing definite form and carrying power so that it reaches the farthest hearer.
   Selection—The Boat Race.
5. Momentum. Work for carrying power in selections that do not aid in giving life. Have pupils learn paragraphs in selection that they may be perfectly free to respond fully with body as well as with voice.
   Selection—Exile of the Acadians.

VII. Sight reading.

Practical application of thought method to enable readers to grasp new thoughts and forms readily and to give to others with expression what has been obtained from printed page, without preparation.

PENMANSHIP.

In this age educational effort is continually directed toward making the best possible environment for the pupil. It has taken years for school officials to learn that the school is for the pupil, and not the pupil for the school. School appliances, methods of discipline and teaching wherein the welfare of the pupil has not been of supreme importance, have been left behind in the onward march of progress. Advancement in science has

revealed many obstructions in child's educational career, and the end is not yet. Every innovation has met with resistance, and the comparatively new system of penmanship is by no means an exception.

This is no place to discuss the merits of the vertical system of penmanship; neither is it necessary to show that our parents are deformed mentally and physically because they were compelled to write by the old time system of penmanship.

Suffice it to say that system is only a means to an end, and vertical penmanship will make a permanent place for itself or be entirely lost, regardless of the attitude of the writer in preparing this outline. Because this outline presents more fully the slant system, it must not be construed as failure on the part of the author, to endorse the vertical system of penmanship.

The ability to express one's thoughts with the greatest ease, speed and legibility must ever be the criterion of good penmanship; the means to that end is a matter for the teacher to determine.

OUTLINE.

I. Object.
   1. Means.
      (1) Of communication.
      (2) Of expression in permanent form.
      (3) Of developing the artistic.

II. Mechanics.
   1. A symbol for each separate idea.
   2. Characters used to be combined into words representing ideas.
   3. Alphabet.
      (1) Meaning of the word.
      (2) Origin of the characters composing the alphabet.
      (3) Changes toward simplicity.
      (4) Names of characters.
         a. Letters.
            (a) Capitals.
               1. Origin.
               2. General use of capitals.
               3. Changes.
               4. Classification—based on principles.
            (b) Small.
               1. Origin.
               2. Changes.
               3. Classification—based on the prevailing principles.

III. Materials.

1. Importance of having suitable material.
2. Kinds of desks, pens, penholders, paper, ink, etc., best suited for the various grades.
3. Use of slates and pencils should be discouraged.
4. The blackboard.
   (1) Its importance.
      a. In teaching form.
      b. In developing movement.
      c. In forming habits of neatness.
      d. In giving general instruction and criticism.
5. Copy books.
   (1) Useful in unifying school in ideas of form.
   (2) Their use may be limited to lower grades.
   (3) Disadvantages from exclusive use.
   (4) Advantages gained by copies written by teacher; the use of practice paper.

IV. The writing exercise.

1. Signals for opening.
   (1) Position at desk.
      a. Body.
      b. Feet.
      c. Arms.
      d. Wrist and hand.
   (2) Arrangement of copy.
   (3) Opening of ink stand.
   (4) Position of pen.
   (5) Movements. Descriptions.
      a. Finger movement. The finger movement consists in the action of the first and second fingers, and the thumb. It is used chiefly in making the upward and downward strokes, as in writing small i and u. The finger movement alone is too limited for free writing; but will be found useful in combination with forearm movement.
      b. Forearm movement. The forearm movement consists in the action of the forearm upon its muscular rest near the elbow; the hand gliding on the nails of the third and fourth fingers. It may be employed in making strokes in any direction, but is especially adapted to carrying the pen rightward, and leftward across the paper, though it is most efficient in combination with the finger movement.

c. Combined movement. The combined movement consists in the united action of the forearm, hand and fingers, the forearm acting on its muscular rest as a center, and sliding the hands on the nails of the third and fourth fingers, while the first and second fingers and thumb extend and contract in forming upward and downward strokes. This movement answers the requirements of business use better than any other. It combines the free untiring sweep of the forearm, with a delicate shaping power of the fingers, thereby securing ease and accuracy.

d. Whole-arm movement. The whole-arm movement consists in the use of the whole arm from the shoulder, the elbow being raised slightly from the desk, and the hand sliding on the nails of the third and fourth fingers. This movement is not to be used in public schools, as it is mainly used for striking large capitals, and flourishes, which things are not in the province of business writing. However, blackboard practice, employing whole-arm movement, is doubtless beneficial to all writers.

(6) Rhythm in writing.
   a. Relation of ryhthm to movement as applied to writing.
   b. Rhythm of movement may be secured.
      (a) By use of counting.
      (b) By use of metronome.
      (c) By use of music.

(7) Sequence of letter forms.
   a. From simple to complex.
   b. Letters similar in form in consecutive order.
   c. Practice more on small letters than on capitals.
   d. Perfect the letter before leaving it.

(8) Criticism.
   a. General, by the teacher.
   b. Individual, by the teacher.
   c. Self-criticism, by the pupil.

IV. **Benefits of thorough work in writing should be.**
- 1. Physical.
  - (1) Makes good writing a muscular habit.
  - (2) Trains the eye to see readily.
- 2. Mental.
  - (1) Develops perception.
  - (2) Trains artistic taste.
  - (3) Develops power of imitation.
  - (4) Trains judgment.
  - (5) Increases power of discrimination.
  - (6) Develops power to image.
  - (7) Increases will power.
- 3. Correlation of penmanship.
  - (1) Penmanship needs to be correlated with all branches requiring written work.
  - (2) Careful work at all times when writing is being done, establishes correct habits of writing.

V. **Signals for Closing.**

Cease writing.
Clean pens.
Close ink-stands.

GEOGRAPHY.

It is thought that if this outline is carefully studied it will give a real knowledge of the things studied. Great emphasis should be placed on the topography of a country and man's adaptation to it. It is hoped a great deal of stress will be placed on the drawings of diagrams, cross sections and outlines. Political divisions are most quickly and satisfactorily reviewed by rapid map drawing. For the work on land forms the government survey maps are specially recommended. Interest is gained through field trips, lantern slides, and small collections of common rocks and minerals.

OUTLINE.

I. **Mathematical geography.**
- 1. Shape of earth.
  - (1) Oblate spheroid modified into a geoid.
    - a. Proofs.
    - b. Results.
    - c. Origin.
      - (a) Rotation.

2. Size of earth.
   (1) Results.
   (Commerce possible with all nations.)
3. Motions of the earth.
   (1) Rotation.
   a. Direction.
   b. Proofs.
   c. Results.
   (a) Day and night.
   1. Longitude and time; local and standard.
   (b) Direction or location.
   1. Poles.
   2. Axis.
   3. Equator.
   4. Circumference.
   5. Diameter.
   6. Parallels.
   7. Meridians.
   8. Great circle.
   9. Small circle.

Pupils to find latitude and longitude of various places, also to know methods of determining latitude: By altitude of sun. By altitude of north star.

(c) Polar flattening.
Results: variation in length of latitude degrees.

(2) Revolution:
a. Relation of earth to sun.
(a) Distance from.
(b) Length of orbit.
Draw orbit on floor to scale.
Reference, Dryer's Lessons in Phys. Geog., page 18.
b. Relation of earth to other planets.
(Very briefly.)
c. Position of axis in relation to plane of orbit.
(a) Results.
1. Seasons as results of.
2. Variation in length of day and night.
(1) In frigid zones.
(2) In temperate zones.
3. Variation in angle at which sun's rays strike earth.
4. Variation in amount of atmosphere sun's rays pass through.
5. Time; year.
6. Zones:
(1) Width of each.
(2) Account for.

II. Physical geography.

1. Atmosphere.
   - (1) Properties of air.
   - (2) Composition of.
   - (3) Weight and height of.
   - (4) Humidity.
     - a. Absolute.
     - b. Relative.
     - c. Capacity.
     - d. Saturation.
   - (5) Moisture of atmosphere.
     - a. Dew and frost.
     - b. Clouds and fog.
     - c. Rain and snow.
   - (6) Temperature of.
     - a. Measurement of.
     - b. Source of heat.
     - c. Methods of warning.
       - (a) Conduction.
       - (b) Convection.
       - (c) Radiation.
     - d. Variations of.
       - (a) According to latitude.
       - (b) According to altitude.
       - (c) According to distance from sea.
       - (d) Due to winds and currents.
     - e. Mapping of temperature.
       - (a) Isotherms.
   - (7) Pressure of atmosphere.
     - a. How measured?
     - b. How mapped? Isobars.
     - c. Results of differences in pressure.
   - (8) Winds and calms.
     - a. Prevailing westerlies.
     - b. Trades.
     - c. Horse latitude.
     - d. Doldrums.
     - e. Monsoons.
     - f. Land and sea breezes.
   - (9) Storms.
     - a. Temperate latitude cyclones.
     - b. Tropical cyclones.
     - c. Thunderstorms.
     - d. Tornadoes.
   - (10) Distribution of rain and snow.
     - a. Variation with latitude and altitude.
     - b. Distance from sea.
     - c. Relation to storm centers.

2. Oceans.
   (1) Ocean basins.
      a. Location.
      b. Topography of.
   (2) Continental shelves.
      a. Cause of.
      b. Location of.
   (3) Islands in ocean.
      a. Kinds.
         (a) Volcanic.
         (b) Coral.
   (4) Ocean temperature.
      a. Surface.
      b. Bottom.
   (5) Movements of ocean.
      a. Waves.
      b. Currents.
         (a) Location of chief eddies and streams and currents.
      c. Tides. (Very briefly.)
      d. Creep.
         (Slow movement of water at ocean bottom from poles to equator.)
      e. Exploration of.
         (a) Methods.
   (6) Benefit to man.
3. Lands.
   (1) Plains.
      a. Kinds.
         (a) Costal plains.
         (b) Gradational plains.
            1. Aggradational.
            2. Degradational.
   (2) Plateaus.
      a. Kinds.
         (a) Lava.
         (b) Uplifted sea bottoms or peneplains.
   (3) Mountains.
      a. Kinds.
         (a) Block mountains.
         (b) Folded mountains.
         (c) Complexly folded mountains.
         (d) Volcanic mountains.

Above forms to be studied in the three stages of youth, maturity and old age. Also types of each kind and stage to be carefully studied. Ref. U. S. topographic maps—especially folios one and two.

4. Rivers and river valleys.
   (1) Intensive study of a typical stream to bring out method of valley growth and development.
   (2) Sources of streams.
   (3) River basins.
   (4) River divides.
   (5) Waterfalls and rapids.
      a. Cause.
      b. Method of recession.
      c. Man's use of.
   (6) Flood plains.
      a. Meanders.
      b. Devees.
      c. Deltas.
   (7) Young, mature and old valleys.
5. Glaciers.
   (1) Intensive study of.
      a. Alpine glacier.
      b. Greenland glacier.
   (2) Condition necessary for formation of.
   (3) Work of a glacier.
   (4) Evidences of glaciation in United States.
      a. The drift.
         (a) Eskers.
         (b) Drumlins.
         (c) Overwash plains.
         (d) Moraines.
         (e) Lakes.
         (f) Rapids and falls.
   (5) Effect on soils.
   (6) Glacial periods.

III. Political geography.

(For study of North America and other continents.)

1. Position.
   (1) Latitude.
   (2) Longitude.
2. Size.
   (1) Compared with other continents.
3. Physiography.
   (1) Account for.
      a. Highlands.
      b. Lowlands.
      c. Coasts.
4. Drainage.
5. Climate.
   Account for
   (1) Temperature.
   (2) Rainfall.
   (3) Winds.

6. Resources—Account for.
7. Location of political divisions.

In this work much is to be made of rapid outline work from memory.

IV. Intensive study of United States.

1. Position.
2. Size.
3. Physiographic regions.
   - (1) Coastal plain } Fall line.
   - (2) Piedmont belt }
   - (3) Alleghany ridges.
   - (4) Alleghany Plateau.
   - (5) Prairies.
   - (6) Laurentian Highland.
   - (7) Ozark Plateau.
   - (8) Ouachita Mountains.
   - (9) Great Plains.
     - a. Interruptions to Great Plains.
       - (a) Black Hills.
       - (b) Sand Dunes.
       - (c) Bad Lands.
   - (10) Red River Valley.
   - (11) Rockies.
   - (12) Columbia Plateau.
   - (13) Colorado.
   - (14) Great Basin.
   - (15) Sierra Nevada.
   - (16) Cascades.
   - (17) Californian and Sound Valleys.
   - (18) Coast ranges.

Study above regions in relation to.

1. Position.
2. Origin.
3. Topography.
4. Climate.
5. Resources.

Account for position of chief cities in these regions.

References:—Mills International Geography, page 719, Fryes Geography, page 32.

V. Intensive study of France as type for any country.

1. Position.
   - (1) In reference to Europe.
   - (2) In reference to United States.
   - (3) In reference to England
   - (4) In reference to Mediterranean Sea.

   (Use Globe)
2. Outline.

   Quick drawing of and location of boundaries.

3. Surface.
   (1) Of Central Plateau.
   (2) Of Paris Basin.
   (3) Of Brittany.
   (4) Of Ardennes Highland.
   (5) Of Landes.
   (6) Of Rhone Valley.
   (7) Of Alps.
   (8) Of Pyrenees.
4. Drainage.
   (1) Loire.
   (2) Seine.
   (3) Rhone.
   (4) One hundred navigable rivers. Canals connect all principal rivers. Advantage?
5. Climate.
   Note wide range. Advantage?
6. Resources.
   (1) Much good soil.
      a. Growth of,
         (a) Wheat.
         (b) Mulberry.
         (c) Olive—why important.
         (d) Grape.
   (2) Mineral wealth.
      a. Coal.
      b. Iron.
7. Occupations.
   (1) Agriculture.
   (2) Manufacturing. (Third nation in the world.)
8. Cities.
   (1) Paris.
      a. Population.
      b. Compare with London.
      c. Compare with New York.
      d. Compare with other chief cities of France
9. People and their characteristics.
10. Government (very brief).
11. Large army and navy—why?
12. Education.
13. Trade with United States.

ARITHMETIC.

This outline pre-supposes a fair knowledge of the facts and the principles of arithmetic. This the average high school pupil should possess. By whatever method reached, at this time in the pupil's experience, he ought to have a knowledge of the fundamental concepts of the science, and enough of the art to give him comparative speed and accuracy in performing the required operations.

The work here presented, if not the most valuable considered either from a utilitarian or disciplinary standpoint, is sufficiently important to deserve a place. The instructor must give constant attention to the matter and method of the subject, that the pupil may keep in mind that the study of arithmetic includes very much more than the mere solving of problems under the various subjects. It should call out a maximum of thought and a minimum of mechanical operations. Much attention should be given to the synthesis suggested throughout the outline. This will give a power of thought, acquired in no other way. If care be taken to have the problems take as wide a range as possible, the exercise will give the pupil a grasp of the subject which cannot be obtained by solving problems.

OUTLINE.

I. **Definition.**

II. **Value.**
- 1. Disciplinary.
- 2. Utilitarian.

III. **Notation.**
- 1. Roman.
  - (1) Definition.
  - (2) Letters used and their values.
  - (3) Principles governing the use.
  - (4) Drills in writing numbers.
- 2. Arabic.
  - (1) Definition.
  - (2) Characters used.
  - (3) Orders of units.
  - (4) Drills in writing both integers and decimals.

IV. Operations of arithmetic
Fundamental
1 Addition.
(1) Definition.
(2) Terms used.
a. Addends.
b. Sum.
c. The sign. Its force when used alone and when combined with multiplication, division or aggregation.
(3) Drills for rapid work.
a. Speaking the sum of two numbers at sight.
b. Speaking the sum of three numbers at sight.
(4) Cases, requiring addition—synthesis of problems.
(5) Synthesis of problems, also solving problems.
2. Subtraction.
(1) Definition.
(2) Terms used.
a. Minuend.
b. Subtrahend.
c. Remainder. Compare with addition.
(3) The sign. Force when used alone, and when combined with other signs.
(4) Drills for rapid work.
a. Speaking the difference between two numbers at sight.
b. Speaking the difference between one number and the sum of two others at sight.
(5) Cases requiring subtraction. Synthesis of problems.
(6) Synthesis of problems, also the solving of problems.
3. Multiplication.
(1) Definition.
(2) Terms used.
a. Multiplicand.
b. Multiplier.
c. Product. Compare with addition.
(3) The sign. Force when used alone and when combined with other signs.
(4) Drills for rapid work.
a. Speaking the product of two numbers at sight.
b. Speaking the sum of two numbers multiplied by a third.
c. Difference between two numbers multiplied by a third.
(5) Cases requiring multiplication. Synthesis of problems.

4. Division.
   (1) Definition.
   (2) Terms used.
      a. Dividend.
      b. Divisor.
      c. Quotient. Compare with multiplication. Compare with subtraction.
   (3) The sign. Force when used alone and when combined with other signs.
   (4) Drills for rapid work.
      a. Speaking the quotient from two numbers.
      b. The product of two numbers divided by a third.
      c. The sum of two numbers divided by a third.
   (5) Cases requiring division. Synthesis of problems.

Secondary operations.
   (1) Factoring.
      a. Division.
      b. Divisibility of numbers.
      c. Drills on numbers below 100.
      d. Drills on numbers above 100.
   (2) Cancellation.
      a. Definition.
      b. Drills.

   NOTE—Do not allow the numbers to be crossed out. Make a thorough drill of them.
   (3) Common divisors.
      a. Definition.
      b. Method for finding compound.
      c. Drills in the inspection method.
      d. Synthesis of problems requiring the finding of the G. C. D.
   (4) Common multiples.
      a. Definition.
      b. Method for finding compound.
      c. Drills in the inspection method.
      d. Synthesis of problems requiring the finding of L. C. M.
   (5) Involution.
      a. Definition.
      b. Index of power. Simple index. When the index is composite.
      c. Finding a power.
      d. Drills in squaring numbers consisting of tens and units by the formula,
         $T^2+2\ T\ U+U^2$
      e. Drills in cubing numbers consisting of tens and units by the formula,
         $T^3+3\ T^2\ U+3\ T\ U^2+U^3$

(6) Evolution.
a. Definition.
(a) Square root.
1. Define.
2. Square root from factors.
$8X12X6=4X2X3$.
3. Square root of perfect powers by inspection, by reversing involution.
4. Common process.
(b) Cube root.
1. Definition.
2. Cube root from factors.
3. Cube root of perfect powers by inspection.
4. The common process.
5. The principles upon which applications depend.
6. Synthesis and solutions of problems requiring the extraction of square, cube, fourth, fifth and nth roots.

V. **Applications of arithmetical operations.**
1. Ratio.
(1) Define.
(2) Terms used. Antecedent, consequent, couplet, simple, compound.
(3) Sign or how expressed.
(4) Principles governing a change in the terms.
2. Proportion.
(1) Definition.
(2) Terms used. Antecedents, consequents, means, extremes, mean proportional, simple proportion, compound proportion.
(3) Signs or how expressed.
(4) The principles.
(5) Forms of statement. Proportion, cause and effect, analysis.
(6) Its application to measurement of wood, masonry, carpeting, similar surfaces and similar solids.
(7) Synthesis and solution of problems.
3. Partnership.
(1) Definition.
(2) Terms used. Simple partnership, compound partnership, capital, profit, loss.
(3) Principles.
a. When times are equal.
b. When capitals are equal.
c. When both capital and time are unequal.
(4) Problems to illustrate. Solved. Common and metric measures.

4. Measures of extension.
   (1) Definition.
   (2) Common table.
   (3) Mariner's table.
   (4) Metric table.
   (5) Drills in reduction.
5. Measures of surface.
   (1) Definition.
   (2) Common table.
   (3) Surveyor's table.
   (4) Metric table.
   (5) Drills in reduction.
6. Measures of volume.
   (1) Definition.
   (2) Common table.
   (3) Metric table.
   (4) Drills in reduction.
7. Measures of capacity.
   (1) Definition.
   (2) Dry measure.
   (3) Liquid measure.
   (4) Apothecaries' liquid measure.
   (5) Metric measure.
   (6) Drills in reduction.
8. Measures of weight.
   (1) Definition.
   (2) Avoirdupois table.
   (3) Apothecaries' table.
   (4) Troy or mint table.
   (5) Metric table.
   (6) Drills in reduction.
9. Miscellaneous measures.
   (1) Bunchings. (Two tables.)
   (2) Time.
   (3) Angular space.
   (4) Drills in reduction.
   (5) Drills in fundamental operations, as applied to compound numbers.
   (6) Longitude and time.

VI. Fractions.

1. Definition.
2. Terms used.
   (1) Numerator.
   (2) Denominator.
   (3) Fractional unit.
   (4) Similar.
   (5) Dissimilar.

3. Classes of fractions.
   (1) As to value.
   (2) Proper and improper.
   (3) As to form.
   (4) Simple, compound and complex.
4. Reduction of fractions.
   (1) To lowest terms.
   (2) To highest terms.
   (3) To whole or mixed numbers.
   (4) Mixed numbers to improper fractions.
   (5) Compound to simple.
   (6) Complex to simple.
   (7) Simple to continued.
   (8) Continued to simple.
   (9) To a common denominator.
   (10) To a decimal.
   (11) Decimals to common fractions. (Give thorough drill on the above.)
5. Fundamental operations, applied to fractions.
   (1) Addition.
      a. How performed.
      b. Synthesis and solving of problems.
   (2) Subtraction.
      a. How performed and why.
      b. Synthesis and solving of problems.
   (3) Multiplication.
      a. How performed and why.
      b. Synthesis and solving of problems.
   (4) Division.
      a. How performed and why.
      b. Synthesis and solving of problems.
   (5) The application to problems.
      a. Given the whole and a fractional part, to find the value of that part.
      b. Given the fractional part and its value, to find the whole.
      c. Given the whole, to find the value of a fractional part more or less than the whole.
      d. Given the value of a fractional part more or less than the whole of a thing, to find the value of the whole.
      e. Given the relative fractional parts and the value of their sum or their difference, to find the value of each.
      f. Given the fractional part of a fractional part and its value, to find the value of the whole.
      g. Given the fractional part of one in terms of a fractional part of another and the value of the sum or the difference of the numbers, to find the numbers.
      h. Form problems to illustrate each of these and note how they must be solved.

VII. Percentage.

1. Definition.
2. Its relation to fractions considered.
3. Terms used. Base, rate per cent, percentage, amount, difference. Define each of these terms.
4. From problems, illustrate each of the above terms.
5. Possible operations.
   (1) The base multiplied by the rate expressed decimally equals the percentage.
   (2) The base multiplied by one plus the rate expressed decimally equals the amount.
   (3) The base multiplied by one minus the rate expressed decimally equals the difference.
   (4) The percentage divided by the rate expressed decimally equals the base.
   (5) The percentage divided by one per cent of the base equals the rate per cent.
   (6) The amount divided by one plus the rate expressed decimally equals the base.
   (7) The difference divided by one minus the rate expressed decimally equals the base.

   NOTE.—Form problems to illustrate each of these operations. Also form such as will combine two or more of them.
6. Applications without time.
   (1) Profit and loss.
   (2) Commission.
   (3) Brokerage, stocks and bonds.
   (4) The exchange.
   (5) Insurance.
   (6) Taxes and duties.
   (7) Trade discount.
   (8) Miscellaneous problems, solved in the applications without time.
7. Applications with time.
   (1) Interest. Its elements and possible cases.
   (2) True discount. Its elements and possible cases.
   (3) Bank discount. Its elements and possible cases.
   (4) Partial payments. United States rule. The merchants rule and annual interest rule compared.
   (5) Equation of payments.
   (6) Miscellaneous problems solved in each of the applications with time.

VIII. Mensuration.

1. Definition.
2. Lines.
   - (1) Definition.
   - (2) Kinds. Straight, curved, broken, parallel, perpendicular, horizontal.
3. Angles.
   - (1) Definition.
   - (2) Kinds. Right and oblique.
4. Plane figures.
   - (1) Definition.
   - (2) Terms. Area, polygon, regular, perimeter, similar, base, altitude.
   - (3) Triangles.
     - a. Definition.
     - b. Kinds.
     - c. How find area.
   - (5) Circles.
     - a. Definition.
     - b. How find circumference and area.
5. Solids.
   - (1) Definition.
   - (2) Terms used. Base, edge, face, altitude, slant height, lateral surface, volume, equivalent solids.
   - (3) The prism.
     - a. Definition.
     - b. How find lateral surface and volume.
   - (4) Pyramid and cone.
     - a. Definition.
     - b. How find lateral surface and volume.
   - (5) The sphere.
     - a. Definition.
     - b. How find surface and volume.
   - (6) General drill on problems and mensuration, involving the measurements of floors, walls and ceilings of rooms, etc.

GRAMMAR.

In teaching grammar, it should never be forgotten that the real object is to teach pupils *how* to speak and to write the English language correctly, and to read it intelligently. Analysis and parsing, favored by many, and condemned by a few, are only a means to this end. There is unanimity in reference to the end sought. The means must be left to the individual teacher.

This outline attempts to place before the pupil only the subject-matter of grammar. The method and sequence must be determined by the teacher.

OUTLINE.

I. The sentence.
  1. Classes.
    (1) Form.
      a. Simple.
      b. Complex.
      c. Compound.
    (2) Meaning.
      a. Declarative.
      b. Interrogative.
      c. Imperative.
      d. Explanatory.
  2. Elements.
    (1) Subject.
      a. Noun.
      b. Pronoun.
      c. Infinitive.
      d. Participle.
      e. Prepositional phrase.
      f. Noun clause.
    (2) Predicate.
      a. Give a list of finite verbs in common use.
      b. Give common verb phrases—has been running, has been going, etc.

(3) Complement.
  a. Definition.
  b. Kinds.
    (a) Object.
      1. Definition.
      2. Tests for object complement.
        (1) Verb expresses action.
        (2) Object is affected by the act.
        (3) Object may become the subject, if the verb is changed to the passive voice.
      3. Give ten sentences containing objects and apply the tests.
      4. Kinds of object complements.
        (1) Noun.
        (2) Pronoun.
        (3) Infinitive.
        (4) Participle.
        (5) Noun clause.
    (b) Subjective.
      1. Definition.
      2. Tests.
        (1) When noun element, same as the subject.
        (2) When adjective element, modifies the subject.
      3. Give sentences and apply the tests.
      4. Kinds of subjective complement.
        (1) Noun.
        (2) Pronoun.
        (3) Participle.
        (4) Infinitive.
        (5) Prepositional phrase.
        (6) Noun clause.
      5. Give sentences to illustrate the above uses.
    (c) Objective.
      1. Definition.
      2. How it differs from the object complement.
      3. Tests.
        (1) Follows the object complement in the sentence.
        (2) Adds to or changes the assertion.
        (3) When a noun element, it is the same as the object.
        (4) When an adjective element it modifies the object.

4. Give sentences and apply tests.
5. Kinds of objective complement.
   (1) Noun.
   (2) Pronoun.
   (3) Participle.
   (4) Infinitive.
   (5) Prepositional phrase.
6. Illustrate the above uses in sentences.

(d) Adverbial modifiers.
1. Indirect objects.
   (1) Definition.
   (2) How they differ from prepositional phrases.
   (3) What they modify and why.
   (4) Verbs that take indirect objects; allow, ask, bring, give, leave, make, offer, etc.
   (5) Form sentences containing indirect objects; example: Take him the book.
   (6) Adjectives and adverbs that take indirect objects: Like, unlike, near, nigh, opposite.
   (7) Form sentences containing indirect objects, modifying these words.
      a. He is like his father.
      b. They fought like brave men.
2. Adverbial nouns.
   (1) Definition.
   (2) How they differ from indirect objects.
   (3) How they differ from prepositional phrases.
   (4) What they modify and why.
      a. Denote manner, extent, degree, etc.
         Ex. The land is worth forty dollars an acre.

(e) Possessive modifiers.
1. Appositive noun.
2. Adverb of position, or expletive.
3. Nouns used independently.

(f) Prepositional phrase.
1. Form.
(1) Simple.
(2) Complex.
(3) Compound.
2. Uses.
(1) Adjective.
(2) Adverbial.
(3) Noun.
a. Subject.
b. Subjective complement.
3. Principal element of a prepositional phrase.
(1) Noun—This is the city of Chicago.
(2) Pronoun—This is for you
(3) Phrase — The Indians fired from behind the tree.
(4) Clause—I am surprised at what you say.
Form sentences, fully illustrating the above.

(4) Verbals.
a. Classes.
(a) According to form.
1. Regular.
2. Irregular.
(b) According to relation to object.
1. Transitive.
2. Intransitive.
b. Properties.
(a) Voice.
1. Active.
2. Passive.
(b) Form.
1. Infinitive.
2. Participle.
(c) Tense.
1. Infinitive form.
(1) Present tense.
(2) Present perfect tense.
2. Participle form.
(1) Present.
(2) Past.
(3) Present perfect.

c. Verbal phrases.
(a) Participial phrase.
(b) Infinitive phrase.
(c) Uses of both participles and infinitives.
1. Noun uses.
(1) Subject.
(2) Object complement.
(3) Subjective complement.
(4) Appositive.
(5) Object of preposition
2. Adjective uses.
(1) Adjective modifier.
(2) Subjective complement.
3. Adverbial use.
(1) Adverbial modifier.
4. Independent.

d. General discussions.
(a) Show how verbals take complements.
(b) Show how verbals are transitive or intransitive.
(c) Give all the forms of both participles and infinitives.

(5) Clauses.
a. According to form.
(a) Simple.
(b) Complex.
(c) Compound.

b. According to use.
(a) Noun.
(b) Adjective.
(c) Adverbial.

c. Kind.
(a) Adjective clause.
1. Use.
(1) Adjective modifier.
2. Connectives used in adjective clauses.
(1) Relative pronoun.
(2) Relative adverb.
3. Bring out clearly the importance of the connective in the clause. Show that it has two uses in the sentence—as a connective, and to fill some other office in the sentence,
4. Antecedent.
(1) Definition.
(2) Construction.
5. Offices which the relative pronoun fills in the sentence.

(1) Subject—The man, who was here, has gone.
(2) Object—The man, whom you saw, is gone.
(3) Subject complement—He is not the man, that I thought he was.
(4) Possessive modifier—He is a man, whose integrity is spotless.
(5) Object of preposition—He is the man, whom I referred to.

(6) Relative adverb.
1. Example: The place, where they live, is beautiful.
a. Show its adverbial use.
b. Explain its antecedent.
c. Show that it is an equivalent to a prepositional phrase, whose base is a relative pronoun.
2. Adverbial clause.
a. Use.
1. Adverbial modifier
b. Connective.
1. Subordinate conjunction.
(1) Example: If you study, you will succeed.
2. Conjunctive adverb.
(1) Example: We will go when spring comes.
c. Classes, according to meaning.
(a) Time.
(b) Place.
(c) Manner.
(d) Degree.
(e) Cause.
(f) Condition.
(g) Concession.

(7) Noun clause.
1. Uses.
(1) Subject.
(2) Object complement.
(3) Objective complement.
(4) Appositive.
(5) Object of preposition.

2. Connective in noun clauses.
   (1) Subordinate conjunction.
      a. Example: That he will go, is known.
   (2) Conjunctive pronoun.
      a. Example: We do not know who will go.
   (3) Adjective.
      a. Example: We do not know which boy will go.
   (4) Adverb.
      a. Example: I do not know when he will go.
   (5) Show clearly the difference between the conjunctive pronoun and the relative pronoun.
   (6) Discuss compound conjunctive pronouns.

(8) Abridged clauses.
   1. Definition and explanation.
   2. Difference between abridged clauses and other clauses.
   3. Case of the subject in abridged clauses.
   4. Predicate.
      (1) What kind.
   5. Uses of abridged clauses.
      (1) Noun uses.
         a. Subject.
            (a) Example: His being absent caused the delay.
         b. Object complement.
            (a) Example: We expect him to be elected.
         c. Object of a preposition.
            (a) Example: I did not think of his being there.
      (2) Adverbial use.
         a. Adverbial modifiers.
            (a) Example: His being a foreigner, his family was protected.
      (3) Show the difference between abridged clauses and verbal phrases.
      (4) Why are there no connectives in abridged clauses?
      (5) In what cases may the subjective complement be?

(9) Parts of speech.
  a. Nouns.
    (a) Classes.
      1. Proper.
      2. Common.
        (1) Class.
        (2) Collective.
        (3) Abstract.
        (4) Mass.
        (5) Verbal.
    (b) Common nouns used as proper nouns.
    (c) Proper nouns used as common nouns.
    (d) Give examples of each.
  b. Pronouns.
    (a) Personal.
      1. Simple.
      2. Compound.
    (b) Relatives.
      1. Who, which, what, that, but, and as, with compound forms of first three.
      2. Their use in sentences.
      3 Use of the double relative what.
    (c) Interrogative.
      1. Who, which and what with their declined forms.
    (d) Adjective.
      1. This, that, all, none, many, etc.
    (e) Difference between adjective pronouns and pronominal adjectives.
    (f) Uses of pronouns.
      1. Use of who, which and that.
      2. Use of each, either, neither, none, etc.
    (g) Properties of nouns and pronouns.
      1. Gender.
        (1) Masculine.
        (2) Feminine.
        (3) Neuter.
        (4) Common.
        (5) Gender of collective nouns.
        (6) How gender is distinguished.
        (7) Give exercises, for forming the gender of nouns.
      2. Number.
        (1) Singular.
          a. Give rules for forming the plurals.

b. Plurals of proper and compound nouns.
c. Plurals of collective nouns.
d. Plurals of foreign nouns.

3. Case.
(1) Nominative.
a. Used in what ways in sentences.
(2) Objective.
a. Used in what ways in sentences.
(3) Possessive.
a. Use in sentences.
4) Give lists of nouns and pronouns and form the possessive of compound nouns.
(5) Declension.
a. Noun
b. Pronoun.

c. Verbs.
(a) Classes.
1. Form. Regular and irregular.
2. Use.
(b) Relation to the object.
1. Transitive.
2. Intransitive.
(c) Relation to the subject.
1. Finite.
2. Non-finite.
(d) Transitive and intransitive verbs.
1. Meaning of transitive.
2. Why is it not well to define a transitive verb as one that takes an object?
3. Verbs that are transitive in one sentence and intransitive in another.
4. Distinguish clearly between intransitive verbs and verbs in the passive voice.
(e) Passive verb forms.
1. Tests for passive verb.
(1) Some form of the verb be with the perfect participle.

(2) The subject can be made the object in the active voice.

(3) It can be followed by "by" and the name of the actor.

2. Give lists of passive verbs and apply the tests.

(f) Verbs that have passive form, but not passive voice.

1. He is fallen.
2. The melancholy days are come.

(g) Passive verbs that take an object.

1. He was offered the money.
   We offered him the money.

NOTE—Explain fully the active and passive voice.

(h) The object of a preposition, made the subject of a verb in the passive voice, and the preposition combined with the verb.

1. They laughed at him. (Intransitive.)
2. He was laughed at. (Transitive passive.)

Note.—Give other examples and explain fully.

(i) Passive verbs, which take the subjective complement.

1. He is called John.
   They called him John.
2. The man was considered honest.
   They considered him honest.

(j) The progressive form of the verb and some form of "be" followed by the present participle used as subjective complement.

1. He is deceiving himself.
2. The height of the mountain is deceiving.
3. He is playing ball.
4. His favorite sport is playing ball.

(k) Passive form of the verb, and some form of "be" followed by the perfect participle.

1. The building was finished yesterday.
2. The interior of the building was elegantly finished.

(l) Agreement of the verb with its subject.
1. Finite verb having two or more subjects joined by "or" or "nor," agrees with subject how?
2. Subjects emphatically distinguished agree how?
3. When one subject is affirmative and the other negative, the verb agrees how?
4. Use of either, neither, each. every, all, none, etc.
5. Use of the contraction "don't."

(m) Conjugation.
1. In common form.
2. In progressive form.
3. In passive form.
(Note.—Drill on principal parts of verbs.)

d. Adjectives and adverbs.
(a) Adjective.
1. Descriptive.
2. Definitive.
(b) Adverbs.
1. Time.
2. Place.
3. Manner.
4. Degree.
(c) Comparison of adjectives and adverbs.
(d) Examples and sentences.
(e) Use of phrase adverbs.

e. Prepositions.
(a) Appropriate prepositions.
1. Use of among, between, beside, besides, in, into, etc.
2. Needless use of prepositions.
3. Omission of prepositions.
4. Compound prepositions.
5. Use in sentences.

f. Conjunctions and interjections.
(a) Conjunctions.
1. Co-ordinate.
(1) Copulative.
(2) Adversative.
(3) Alternative.
2. Subordinate.
Review work in connectives.
(b) Use of interjections.

EXERCISES FOR ANALYSIS AND PARSING.

God tempers the wind to the shorn lamb.

Every stalk, bud, flower and seed displays a figure, a proportion, a harmony beyond the reach of art.

The old foreigner's little daughter was ignorant.

She seemed in good health.

She never felt at home in that place.

He came to the throne as ruler at an early age.

Vanity makes the whole world false.

They found her in poor health.

She brought him the petition three times that day.

The room is 20 feet long, 15 feet wide and 10 feet in height.

The senate of the United States shall be composed of two senators from each state, chosen by the legislature thereof, for six years.

He stayed there at least two years too long for his own good.

It is certainly worth a long, hard tramp to the foot of the mountain, and the two mile climb to its summit—this grand view over land and sea.

The control of such a boy, ten hours out of the twenty-four, became every day a greater puzzle.

Expecting to return soon, I did not think of writing you.

What do you expect to gain by trying to defeat the measure?

A man trying to do his duty is a man to be admired.

Judging from his appearance only is not giving him justice.

All that I dread is leaving you behind.

I am monarch of all I survey.

Such as are virtuous are happy.

Tears, such as angels weep, burst forth.

Read "Snow Bound" and analyze parts that are suited to the work.

Read "Thanatopsis" and analyze it. Pay special attention to clauses.

UNITED STATES HISTORY.

"History deals with the life of a people in the process of growth."

The principal ends to be secured in the study of history are memory training, practice in the use of the material of history, exercise for the judgment, and an appreciation of the motives which have guided the chief actors in the events of the past. Historical study is the best training for citizenship, for public life, and furnishes the basis for the decision of any question needing a knowledge of the past for its settlement.

Not all facts are of equal importance, hence the course in the secondary school should lay stress only upon those of most value in determining the course of the life of a people in its development. Attention should be given to the real meaning of events, and their relation to each other.

Geography, literature, and civil government go hand in hand with history and should therefore be correlated with it in the teaching.

A judicious use of the "sources" of history should be made. They may be considered as adjuncts to the text-book work and as a part of the collateral reading, or form a basis for some of the written work.

Note-books should be required in which the pupil may record, not simply facts and statements gathered from the text-book, but rather the results of his own research and thought.

OUTLINE.

I. **North America.**
   1. Physical characteristics.
   2. Native Peoples (study how they have affected our civilization).

II. **Discovery and exploration.**
   1. Causes (study European conditions, 15th, 16th and 17th centuries.)
   2. Enterprises through which it was accomplished.
      (Give attention only to those prominent in establishing or in extending the claims of a nation to territory. The motives of individuals and nations should be sought for. Compare results.)
   3. Effect in Europe.

III. **Colonization.**
   1. Reasons for colonization.
   2. Methods of colonization. Compare.
   3. Growth of English supremacy in America, noting causes and events through which it was accomplished.
   4. Colonies—Study to discover.
      (1) Character and motives of the colonists.
      (2) How affected in their development by geographical conditions.
      (3) The relation of the mother country to the colonies.
      (4) Self-government.
      (5) Union.
      (6) The growth of slavery and its influence.
      (7) Religious conditions.
      (8) Social conditions.
      (9) Intellectual conditions.
      (10) Relation with Indians.
   5. Important topics.
      First Representative Assembly, Slavery, Mayflower Compact, Constitution in Virginia, Toleration Act in Maryland, Fundamental Orders of Connecticut, Massachusetts Body of Liberties, Watertown Protest, Town Meetings, Roger Williams, New England Confederation, Patron System in New Netherland, The Andros Government, Bacon's Rebellion, The Grand Model, The English Conquest of New Netherland, Penn's Plan of Union, Founding of Harvard College, Establishment of Free Schools, and the Albany Congress.
   6. French colonization. Compare with English colonization in regard to motives, methods, government, and extent of territory.

IV. Struggle between France and England for colonial empire, 17th and 18th centuries.

1. Causes.
2. Study the following wars: King William's, Queen Anne's, King George's and French and Indian. Find out results of each.
3. Results—political, geographical, social, industrial and religious.
4. Did the French and Indian war help bring on the Revolution?

V. England's colonial system regarding commerce.

1. Navigation acts, 1645–1696; sugar act, 1733. Discover England's purpose. What restrictions were laid on colonial trade, what industries were encouraged?
2. Restrictions on manufactures.
3. Influence upon the colonies.
4. England's methods of enforcement.

VI. Revolution.

1. Causes.
   (1) Show how the period of colonization prepared the colonists for revolution.
   (2) Trace the development of inter-colonial union against England, 1760–1775.
   (3) England's colonial policy, 1760–1775.
   (4) Influence of George III. and his ministers.
   (5) American and British view of representation. Compare.
2. Campaigns. Note the objects, compare the combatants; give results.
3. Finances.
4. Men prominent during the period, stating why.
5. Results—territorial, political, social, industrial, intellectual.
6. Independence. Trace its growth. Give results.

VII. Formation of American government.

Study the continental congresses, articles of confederation, the constitutional convention, the northwest ordinance.

VIII. The National period.

1. Introduction. Study to discover the condition of the United States in 1789.
2. The federal period, 1789–1801.
   (1) Organization of the government.
   (2) Hamilton's financial measures. Note especially the bank controversy in regard to the intrepretation of the constitution.
   (3) Political parties. Origin, principles of each and history during this period.
   (4) Slavery. Show the legal standing of slavery, and trace the progress of emancipation. Note effect of cotton-gin.
   (5) Foreign relations. Washington's neutral proclamation; Jay's treaty; treaty with Spain, 1795; X. Y. Z. affair.
   (6) Alien and sedition acts. Note in this connection, the Virginia and Kentucky resolutions.
   (7) Election of 1800. Reasons for federal defeat.

3. Republican supremacy, 1801–1825.
   (1) Jefferson and his policy.
   (2) The Louisiana purchase; note the constitutional questions arising out of this purchase. Give results.
   (3) Foreign affairs.
      a. Non-importation and embargo acts; purpose and effect.
      b. War of 1812. Why the "Second War for Independence?"
      c. Treaty with Great Britain, 1818.
      d. Purchase of Florida. What relation between this event and the purchase of Louisiana?
      e. Monroe doctrine.
      f. Russian treaty, 1824.
   (4) The Hartford convention.
   (5) Tariff legislation. Why is the principle of protection introduced?
   (6) Internal improvements. Of what effect was this question on nationalism?
   (7) Slavery.
      a. Show that slavery was "sectional."
      b. The Missouri affair, 1820–21. Why of so much importance?
   (8) Industrial development—inventions and their effect.
   (9) Election of 1824. Parties and principles.
4. Period of transition, 1825–1829.
   (1) Tariff of 1828. Study Calhoun's.
   (2) Internal improvements—Erie canal.
   (3) The railroad, its effect.
   (4) Note the development of the west.
5. National democracy, 1829–1845.
   (1) Jackson, his policy and character.
   (2) Spoils-system. Compare with present system.
   (3) Sectional divergence, trace progress of and note causes. (Study Webster-Hayne debate, nullification in South Carolina.)
   (4) Financial difficulties.
      a. The bank question, 1828–1836.
      b. Specie circular.
      c. Panic of 1837.
   (5) Slavery.
      a. The abolition movement.
      b. Slavery petitions. Effect of this controversy on abolitionism.
      c. Abolition literature. Note the action of southern legislatures.
      d. Political abolition. Influence on elections.
      e. Garrison, Philips, Adams; note views and experience of each.
      f. Balance between slavery and freedom, was it kept?

(6) Foreign relations.
   a. Webster-Ashburton treaty.
   b. The Chinese treaty, 1844.
(7) Industrial development.
(8) Political parties. Note the new principles adopted.
(9) Webster, Clay, Calhoun. Study each as to his policy and influence.

6. National expansion and slavery extension. (Note how slavery affects the question of expansion.)
   (1) Annexation of Texas.
      a. Show how this affected the slavery question.
      b. Its relation to the Mexican war.
      c. Arguments for and against annexation.
   (2) The Mexican cession.
      a. The Wilmot proviso.
      b. Debates on slavery.
      c. Organization of the territory. Note here the effect of the discovery of gold in California.
   (3) Free-Soil party. Its platform and influence.
   (4) Oregon
      a. Claims of different nations.
      b. Treaty with England, 1846.
      c. Relation of this question to Texas annexation.
   (5) Problems of 1849-1850.
      a. Show how these develop from previous questions.
      b. Compromise measure of 1850. Study the work of Clay, Webster, Calhoun, Douglas and Seward. Note how these affected political parties and the slavery question.
   (6) Gadsden purchase.
   (7) Kansas-Nebraska bill.
      a. Study to find out why this bill was passed.
      b. Note the motions of Douglas.
      c. Its effect.
   (8) Dred Scott case. Its effect.
   (9) Northern and southern views in slavery.
   (10) John Brown's raid.
   (11) Trace the industrial development of this period. Account for the conditions in the north and south.
   (12) Trace the political reorganizations from 1845-1860.
   (13) Trace the progress of "sectionalism."

7. Secession and civil war, 1860-1865.
   (1) Secession—causes, method, views of Lincoln and other statesmen, effect.
   (2) Organization of Confederate States of America. Compare plan of government with that of the United States.
   (3) Civil war causes, campaigns, attitude of foreign powers, slavery in its relation to the war, results.

(4) Financial policy. Greenbacks, national bank act, internal revenue system, tariffs.
(5) Grant and Lee. Study each as to policy and influence.

8. Reconstruction period, 1865-1871.
   (1) Note the process of reconstruction and give results.
   (2) Foreign relations. Purchase of Alaska. Treaty with China.
9. Natural growth, 1871-1903.
   (1) Trace political development.
   (2) Financial history. Revenue, silver legislation, present policy.
   (3) Foreign affairs. Treaty of Washington; Northwestern fishery question; Behring Sea controversy; Venezuelan trouble; Hawaiian question; War with Spain; War in China; Samoan trouble with Germany; Relations with Cuba.
   (4) Industrial development.
   (5) Intellectual and social conditions.
   (6) Present problems.
10. Trace the two theories, State Sovereignty and National Sovereignty, as shown in the events of the national period.

PHYSIOLOGY.

The value of physiology depends largely on the way it is presented. The facts that the skeleton is the frame work of the body and consists of 208 bones more or less—the names of these, etc., are valuable in so far as they furnish a foundation for thorough instruction in physiology and hygiene.

The instructor should keep in mind the fulfillment of the state law—not in letter but in spirit—in the presentation of every topic.

No teacher should be satisfied to teach the subject till he has had a thorough course in laboratory biology.

The hygiene of the various organs and functions should be prominently in the mind of the instructor at all times.

The study of the various tissues, organs, and functions of the body should be accompanied by laboratory work by the pupil, as well as dissections by the teacher, performed before the class.

The laboratory equipment should consist of compound microscopes, dissecting microscopes, dissecting tools, test tubes, beakers, evaporating dishes, and the necessary reagents for testing the composition of the various kinds of foods, tissues, etc. If possible a good solar lantern with microscope attachment should be added to the equipment. This apparatus is especially valuable as it can be used also in physics, history, literature, and geography.

OUTLINE.

I. **Introduction.**
   1. Definitions of anatomy, physiology and hygiene.
   2. Living bodies and cells.
      (1) The ameba (simplest form of animal life).
      (2) Cells.
         a. Parts
         b. Methods of reproduction.
         c. Modifications of form and use in the body.
      (3) Tissues.
         a. Muscular.
         b. Epithelial.
         c. Nervous.
         d. Connective.
         e. Osseous.
         f. Adipose.
      (4) Fluids of the body.
         a. Blood.
         b. Lymph.
         c. Synovia.
         d. Digestive fluids.
      (5) Organs.
         a. Definition and examples.
      (6) Systems.
         a. Definition and examples.

II. **The skeleton.**
   1. General view, uses and adaptation.
   2. Structure, parts and composition of bones.
   3. Joint—kinds and adaptation, ligaments.
   4. Divisions.
      (1) Trunk—names and uses of bones.
      (2) Head and face—names and uses of bones.
      (3) Limbs—names and uses of bones.

III. **Muscular system.**
   1. Structure, attachment and uses.
   2. Classification.
      (1) As to structure.
         a. Striated—voluntary.
         b. Non-striated—involuntary.
      (2) As to form.
      (3) As to arrangement.
   3. Names of important muscles.

IV. Digestion.

1. Objects.
2. Organs—description and function of each.
3. Waste and repair in the body.
4. Foods.
   - (1) Classes of foods and value of each.
   - (2) Parts of food acting upon and digested by each fluid, including some examination into the chemical processes.
5. Absorption.
   - (1) Organs.
   - (2) Processes.
6. Hygiene.
   - (1) Indigestion, causes, preventions.
   - (2) Scientific and practical cookery.
   - (3) Microbes in relation to digestion and indigestion.

N. B. Special attention should be given to the care of the teeth.

VI. Circulation and respiration.

1. Object of circulation two-fold.
2. Organs of circulation.
   - (1) Heart—parts, structure and use.
   - (2) Arteries—parts, structure, use and names.
   - (3) Capillaries.
   - (4) Veins and lymphatics.
   - (5) Lymphatic glands, structure and use.
3. Object of respiration.
4. Organs of respiration.
   - (1) Lungs—structure, changes in blood and air in lungs.
   - (2) Passages connecting lungs with the outer world.
     - a. Organs of speech—structure and adaptation.
   - (3) Diseases of the air passages.

Hygienic recommendations; colds, catarrh and consumption should receive special attention.

VII. Excretion.

1. Organs.
   - (1) Skin.
     - a. Parts.
       - (a) Dermis.
       - (b) Epidermis.
       - (c) Perspiratory glands.
       - (d) Nerve terminations.
       - (e) Appendages.
         1. Nails uses and growth.
         2. Hair—care, structure, uses.
     - b. Uses.
       - (a) Protection.
       - (b) Excretion.
       - (c) Temperature regulation.
       - (d) Organ of sensation.

c. Bathing. Kinds of baths; virtues of each and best time to take them.

(?) Kidneys and bladder.

a. Structure.

b. Uses.

VIII. Nervous system.

1. Divisions.

(1) Cerebro—Spinal.

a. Parts.

(a) Brain.

1. Parts.
2. Structure.
3. Coverings and protection.

(b) Spinal cord.

1. Parts.
2. Structure.
3. Protection.

(c) Ganglia.

1. Structure.
2. Uses.

(d) Nerves.

1. Classification as to use.
2. Classification as to location.
   (1) Cranial—names and uses.
   (2) Spinal—number and uses.
3. Structure.
4. Reflex action.

(2) Sympathetic system.

a. Parts—nerves and ganglia.

b. Arrangement.

c. Uses.

2. Hygiene of the nervous system.

IX. The special senses.

1. Touch, taste and smell.
   (1) Structure.
   (2) Function.
   (3) Hygiene of each organ.
2. The eye.
   (1) Structure.
   (2) Function of each part.
   (3) Defects of the eye, causes and remedies.
3. The ear.
   (1) Structure.
   (2) Function of each part.
   (3) Defective hearing; causes and preventions.

X. Narcotics should be treated in relation to each organ affected, and attention should be given to effect on the morals and on crime.

DIDACTICS.

I. **The teacher.**
- 1. Teaching as a profession.
  - (1) Compensations.
  - (2) Drawbacks.
  - (3) Importance.
- 2. The ideal teacher.
  - (1) Aim.
  - (2) Methods.
  - (3) Personal habits.
  - (4) Sense of responsibility.
  - (5) Pestalozzi, the ideal.
    - a. His work with children.
    - b. His methods.
    - c. His writings.
    - d. His influence on present day teaching.
- 3. The teacher's qualifications.
  - (1) Natural.
    - a. Physical.
    - b. Mental.
  - (2) Acquired.
    - a. General preparation.
    - b. Professional training.
    - c. Experience.
- 4. Professional growth.
  - (1) Schools.
  - (2) Literature.
  - (3) Institutes.
  - (4) Teachers' associations.
  - (5) The reading circle.
- 5. The teacher's influence.
  - (1) In school.
  - (2) In community.
  - (3) Among fellow teachers.

II. **The school equipment.**
- 1. School grounds.
  - (1) Ornamentation.
  - (2) Supervision.
- 2. School building.
  - (1) Ventilation and light.
  - (2) Seating.
  - (3) General care.
  - (4) Care in case of contagious disease.
  - (5) Beautifying.

3. School apparatus.
   (1) What is desirable.
   (2) What is indispensable.
   (3) How to secure it.
   (4) How to use it.
   (5) How to take care of it.
4. School library.
   (1) How to secure it.
   (2) Choice of books.
   (3) Use of library.
      a. Advantages.
      b. Dangers.
5. Text-books.
   (1) Characteristics of good text.
   (2) Use of text by pupil.
      a. In preparation.
      b. In recitation.
   (3) Use of text by teacher.
      a. In preparation.
      b. In recitation.

III. School management.

1. Preliminary.
   (1) School records.
   (2) Preparation of buildings and grounds.
   (3) Seating.
   (4) Signals.
   (5) Temporary program.
2. Permanent organization.
   (1) Classification.
   (2) Permanent program.
   (3) General regulations.
3. Opening exercises.
   (1) Real purpose and value.
   (2) Kinds.
   (3) Methods of presentation.
4 Government.
   (1) Good order defined.
   (2) How to secure good order.
      a. Personality of teacher.
      b. Healthy public sentiment in school and community.
      c. Comfortable surroundings.
      d. Occupation of time in interesting work.
   (3) Cause of disorder.
   (4) Consequence of disorder.
      a. Direct.
      b. Remote.

(5) Punishments.
a. When justifiable.
b. Forms.
(a) Proper.
(b) Improper.
c. How administered.

5. The movements of the school.
(1) To and from classes.
(2) Change of work.
(3) Wraps, books, materials, etc.

IV. The pupil.

1. Physical factors in education.
(1) General health.
(2) Personal habits.
(3) Physical tests.
(4) The nervous system.
(5) Suitable indoor exercises.
(6) Suitable outdoor exercises.
a. Need of supervision.
(7) Causes of dullness.
a. Fatigue.
b. Improper food.
c. Improper habits.

2. Attention.
(1) Definition.
(2) Importance.
(3) Kinds.
(4) Characteristics.
(5) How secured.
a. Proper environment.
b. Proper classification.
c. Personality and skill of teacher.

3. Special senses.
(1) Organs.
(2) Functions.
(3) Defects.
(4) Training.
(5) Tests.

4. Training the senses.
(1) Aims.
(2) Material.
(3) Methods.
a. Object lessons.
b. Nature study.

5. Memory and imagination.
(1) The representative process.
(2) The culture epoch theory.
(3) Means of development.
(4) Tests.

6. Reasoning powers.
   (1) How concepts are formed.
   (2) Deduction and induction.
   (3) Methods of cultivating the judgment.
7. The will.
   (1) Training in school work.
   (2) Habits to be formed in school work.
   (3) Relation of habit to character.
   (4) Breaking up bad habits.
8. The emotions.
   (1) Importance in life.
   (2) Proper cultivation.
   (3) Proper control.
   (4) Relations to physical health.
9. Child study.
   (1) Importance.
      a. To pupil.
      b. To teacher.
   (2) Necessary qualifications.
      a. Power of observation.
      b. Interest and sympathy.
      c. Power of interpretation.
   (3) Fundamental questions.
      a. What did the child do?
      b. What does the action mean?
   (4) Methods of study.
      a. Observational.
      b. Experimental.
   (5) Aids to study.
      a. Close association with pupils.
      b. Acquaintance with parents.
      c. Books.
   (6) Value of child study to teacher.
      a. Produces right relations to pupils.
      b. Prevents hasty reproof, incorrect judgments, ill-advised punishment.
      c. Creates interest and sympathy for children.
      d. Induces real teaching.
10. How children learn.
   (1) Sensation and perception.
   (2) Value of nature study and object-lessons.
   (3) Laws of association.
   (4) Assimilation of new ideas.

V. The lesson.

1. Kinds.
   (1) Information lessons.
   (2) Training lessons.
   (3) Drills, reviews, tests.
2. Teacher's preparation for lesson.
   (1) Knowledge of subject.
   (2) Selection and arrangement of material.
   (3) Correlation with other lessons.
3. Pupil's preparation. Study.
   (1) What is study?
   (2) Object.
   (3) Incentives.
      a. Proper.
      b. Doubtful.
      c. Improper.
   (4) How to study.
   (5) When to study.
   (6) Favorable conditions.
   (7) Aid to be given by teacher.
      a. Independence and power must be developed.
4. The recitation.
   (1) Importance.
   (2) Aims.
   (3) Requisites.
   (4) Methods.
   (5) Results.
   (6) Questioning.
      a. Value.
      b. Testing questions.
      c. Training questions.
      d. Forms of questions.
      e. Faulty questions.
      f. Treatment of answers.
5. Teaching.
   (1) Nature of process.
   (2) Essentials of good teaching.
      a. Knowledge of mental processes.
      b. Good preparation.
      c. Definite aim.
      d. Correct methods.
      e. Earnestness, zeal, good judgment, sympathy.
6. Illustrations.
   (1) Object and advantages.
   (2) Kinds.
      a. Appealing to senses.
      b. Appealing to imagination.

ALGEBRA.

Cajori says in the introduction to his history of mathematics: "A class in arithmetic will be pleased to hear about the Hindoos and their invention of the 'Arabic notation'; they will marvel at the thousands of years which elapsed before people had even thought of introducing into the numeral notation that Columbus-egg—the zero; they will find it astounding that it should have taken so long to *invent* a notation which they themselves can now *learn* in a month. After the pupils have learned how to bisect a given angle, surprise them by telling of the many futile attempts which have been made to solve, by elementary geometry, the apparently very simple problem of the trisection of an angle. When they know how to construct a square whose area is double the area of a given square, tell them about the duplication of the cube—how the wrath of Apollo could be appeased only by the construction of a cubical altar double the given altar, and how mathematicians long wrestled with this problem. After the class have exhausted their energies on the theorem of the right triangle, tell them something about its discoverer—how Pythagoras, jubilant over his great accomplishment, sacrificed a hecatomb to the muses who inspired him. When the value of mathematical training is called in question, quote the inscription over the entrance into the academy of Plato, the philosopher: 'Let no one who is unacquainted with geometry enter here.' Students in analytical geometry should know something of Sescartes, and, after taking up the differential and integral calculus, they should become familiar with the parts that Newton, Leibniz, and Lagrange played in creating that science. In his historical talk it is possible for the teacher to make it plain to the student that mathematics is not a dead science, but a living one, in which steady progress is made."

SUGGESTIONS FOR TEACHING ALGEBRA.

I. The text-book. The book used should be modern Many schools are making the mistake of using texts, which are out of date and unscientific in their treatment of the subject. Many important changes in method of treatment have been made in recent years and the student should have the benefit of them. The text should also be thorough in its presentation of the subject-matter. Difficulties should not be ignored or met in an illogical way. Much of intellectual stimulus is lost in the endeavor to render the subject palatable to the beginner, which so often results in nothing but a mild solution of algebra with no tonic qualities.

II. Transition work. It is a mistake to pass rapidly over the introductory chapter with a view of getting into what is often considered the more important part of the work. This is the place to establish the fact that one is not entering upon an entirely new field, but that he is getting up where he can take a broader view of fields already explored and also look out through new vistas of mathematical truth. The introduction to general and negative number and to the equation in its practical uses may be so given that the student's desire for a closer acquaintance is quickened and his future success in this branch of knowledge practically determined. Give many exercises in the evaluation of expressions; insist upon the checking of results in equations.

III. Special topics. The order will vary with text used. The suggestions follow the usual arangement.

1. Fundamental operations.

(1) With algebraic number. Such principles as that the subtraction of a positive number is equivalent to the addition of a negative number of the same absolute value, should be fully illustrated. If proofs are given they should be rigorous. Illustrations should not be called proofs. In general the student is not given credit at this point for as much ability as he really possesses. One who is ready for the study of algebra is able to grasp the proof of such a principle as the one named above.

The laws of signs in multiplication and division will follow naturally after the principles taught in addition and subtraction. Mere statements of facts such as, "like signs give plus and unlike signs give minus," should not be accepted in lieu of a knowledge of the principle involved.

The associative and commutative laws which have been used by the student from his earliest days in numbers, should now be recognized by name. They come in naturally with the work in parentheses.

The principles of positive integral powers also belong here.

(2) With integral algebraic expressions. The student will now be ready to take up the application of laws previously learned, to integral algebraic expressions. The teacher's chief aim will be to insist upon clear and accurate definition of the more formal terms of algebra, which arise in this connection.

While the use of the parenthesis is important, long and involved exercises in the removal of the same have no practical bearing upon the future work. In whatever work is done in this line, the student should begin at the outside and remove all parentheses at one reading.

Authors will differ as to the introduction of the equation during this part of the work. Experience has shown that its introduction is very profitable. Solutions should always be checked.

2. Integral Algebraic Equations. The formal treatment of this topic follows naturally upon what the student has learned about the equation in previous chapters. Here again accurate definition will be insisted upon.

Two points should have special emphasis:

(1) The equivalence of equations.

(2) That if both members of an equation be multiplied by zero, or by an expression containing the unknown quantity, the resulting equation is not equivalent to the given one.

The problems found in this chapter will serve to awaken interest and to stimulate thought, but should not be unduly exalted. The student's skill in problems will be in direct proportion to his knowledge of principles and his ability to read understandingly.

3. Type-forms in Multiplication and Division. Thorough drill here will yield abundant fruit in factoring. Literal exponents and other modified forms of the models should be used freely. In division type-forms the principles should be stated and learned in the general form, $(a^n+b^n) \div (a+b)$. Some teachers think

best to connect at once each type-form with its inverse operation in factoring.

4. Factoring. This topic enters so intimately into all succeeding work that it demands a large share of the beginner's time. The skill of a student depends upon his ability to classify and factor miscellaneous exercises; hence, after the typical cases are learned there must be long continued drill upon such exercises. An outline following the order of the text may be made and much supplementary work given.

The following covers the essentials of factoring.

(1) Monomial factors.
(2) Grouping.
(3) Trinomials.
    a. Squares.
    b. Cross products.
(4) Binomials.
    a. Sum of like odd powers.
    b. Difference of like odd powers.
    c. Difference of like even powers.

H. C. F. and L. C. M. have their most practical applications in some of the operations in fractions. They offer opportunity for review in factoring. The major portion of the drill should be upon expressions which can be factored by inspection. The Euclidean method of division in order to find the H. C. F., is in most respects a weariness of the flesh and receives more attention than it deserves. All of practical value that there is in this process can be had by the application of the principle that the H. C. F. of any two expressions is in their sum or their diference, or in the sum or difference of any multiples of the expressions.

Before leaving Factoring the solution of equations by factoring should be taught.

5. Fractions. With factoring well taught, the work in fractions passes off very rapidly. Two points most deserving of emphasis are the rules for signs and the proof for the inversion of the divisor in division of fractions. Complex fractions are sometimes considered fearsome things, but they soon melt away before the skill of the student well drilled in type-forms and factoring. Insist upon a large share of this work being done mentally.

6. Fractional Equations. There are at least two things worthy of special notice here. The first is to unite fractional terms as far as possible before clearing; the second, that in

clearing new roots are sometimes introduced, hence results should be tested to see whether they satisfy the given equation.

In problems the teacher should encourage the student to read the verbal into the algebraic statement with as little written work as possible.

Generalized problems and the interpretation of solutions usually come in here. To omit these topics or give them but a passing notice, is a grevious error as they have in them the very spirit and essence of Algebra.

7. Simultaneous Linear Equations. It is not a difficult matter to teach the mechanical operations involved in this topic. Too frequently it is passed with nothing more than this mechanical part and as a consequence the student has little to show for his efforts.

Special stress should be laid upon the equivalence of systems. Of the methods of elimination commonly used, that by substitution is the most profitable for future work in the evaluation of functions.

8. Inequalities and Indeterminate Equations. If time seems lacking for these topics, let that usually given to pages of long problems under simultaneous equations be divided. There will be a corresponding gain in power.

9. Involution. The proving of such symbolic statements as $(a^m)^n = a^{mn}$; $(ab)^n = a^n b^n$; $(\frac{a}{b})^n = \frac{a^n}{b^n}$, should receive special attention here. Also take up binomials to any power and powers of multinomials.

10. Evolution. Proofs of principles as in involution. Special emphasis on signs of roots. The square and cube root of multinomials should be taught as reasonable processes. After the written process is mastered, give much drill on reading roots up to at least three places by inspection.

11. Surds. No topic is of greater importance in its bearing upon future work than this one. Special stress should be laid upon reduction, because the student who can reduce surd forms easily will have little difficulty with their various combinations. The principles for reduction are those proved and learned in the chapter on evolution.

For oral drill, exercises like the following are suggested: In the series of numbers 1, 2, 3, 4, 5, etc., think of each one under the radical sign, then speak the simplest form of the expression thus made. In like manner take the fractions ½, ⅓, ¼, etc.;

also, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, etc. Various modifications of the above will suggest themselves to the ingenious teacher. Some of the radical forms frequently occurring in Physics and Geometry may be collected and used for drill work.

Imaginary numbers and the Doctrine of Exponents should be brought in with Surds, the order of the text being changed if necessary.

12. Quadratic Equations. The solution of a complete quadratic by factoring has already been presented and will be enlarged upon here. The process of completing the square should then be thoroughly taught. There is nothing to be gained by multiplying processes for completing the square.

For practical purposes the student should be taught to solve quadratics by the general solution derived from the general form $ax^2 + bx + c = o$, or by factoring. There is no more reason for completing a square every time a quadratic is solved, than there would be in performing all the operations necessary to find $(a—b)^3$. Formulæ are labor saving devices. There use need not be merely mechanical, but should rather denote an intelligent effort to avoid needless work. Formulæ are abused when they are used without an understanding of the process of their development.

In simultaneous Quadratics as in Factoring, the best results will be gained from drills in the classification of miscellaneous exercises.

13. Ratio and proportion. The following basic properties should be proved and learned:

(1) The means may be interchanged.
(2) The extremes may be interchanged.
(3) The means may be interchanged, and at the same time the extremes.
(4) The means may be taken as the extremes, and the extremes as the means.

The checking of proportions by substitution is also a point of importance.

Variation should be carefully presented because of its bearing on the work in Physics. Use many practical examples involving the laws of Physics, solving them by the principles of proportion. Develop the power of thinking and speaking such examples in exact terms. There is no place for inexactness in mathematics.

14. The topics mentioned above are those usually covered in a high school course. One intending to teach should, if possible, complete all the chapters included in a secondary algebra. He should at least take Progressions, the Binomial Theorem, and Logarithms.

IV. General suggestions. Much may be done to enliven the somewhat dry and dusty pathway, which the algebra class must follow, by presenting historical facts in connection with the development of the subject. Its beginnings, the growth of its symbolism, its aid in the spread of knowledge, all furnish items of interest to classes. Histories such as those of Cajori, Ball, and Fink, furnish valuable material for this purpose. The teacher will also find help in De Morgan's Study and Difficulties of Mathematics, Lagrange's Lectures on Elementary Mathematics, and Smith's Teaching of Elementary Mathematics.

OUTLINE.

I Definitions
- 1. Quantity.
- 2. Number.
- 3. Axiom.
- 4. Algebra.

II Symbols.
- 1. Of numbers or quantities.
  - (1) Known.
  - (2) Unknown.
  - (3) Positive.
  - (4) Negative.
  - (5) Ambiguous.
- 2. Of operation.
  - (1) Addition.
    - a. Upright cross.
  - (2) Subtraction.
    - a. Horizontal line.
    - b. Wave.
  - (3) Multiplication.
    - a. Oblique cross.
    - b. Dot.
    - c. Parentheses.
    - d. Coefficient.
    - e. Exponent.
    - f. Power.
  - (4) Division.
    - a. Bar and dots.
    - b. Fraction—reciprocal.
    - c. Evolution.

3 Of relation.
(1) Equality.
(2) Inequality.
(3) Variation.
(4) Infinity.
4. Of abbreviation.
(1) Signs of aggregation.
a. Parentheses.
b. Brackets.
c. Brace.
d. Vinculum.
e. Bar.
(2) Deduction.
(3) Continuation.

III. Terms.
1. Definition.
2. Kinds.
(1) Positive.
(2) Negative.
(3) Monomials.
a. Rational.
b. Integral.
c. Degree of.
(4) Polynomials.
a. Binomial.
b. Trinomials, etc.
(5) Homogeneous.

IV. Operations.
1. Fundamental.
(1) Addition.
a. Definition.
b. Co-efficient.
(a) Numerical.
(b) Literal.
c. Principles.
(a) Like terms.
(b) Unlike terms.
(c) Commutative law.
(d) Associative law.
d. Terms used.
(a) Addends.
(b) Amount.
(2) Subtraction.
a. Definition.
b. Terms.
(a) Minuend.
(b) Subtrahend.
(c) Remainder.
c. Law of signs.

(3) Multiplication.
  a. Definition.
  b. Terms.
    (a) Multiplicand.
    (b) Multiplier.
    (c) Product.
  c. Law of signs.
  d. Special cases.
  e. Commutative law.
  f. Associative law.

(4) Division.
  a. Definition.
  b. Terms.
    (a) Dividend.
    (b) Divisor.
    (c) Quotient.
  c. Special cases.
  d. Law of signs.

2. Uses of parentheses.
  (1) Principles for removing quantities.
  (2) Principles for enclosing quantities.

3. Formula.
  (1) Squares and cubes of the sum of two quantities.
  (2) Squares and cubes of the difference of two quantities.
  (3) Product of sum and difference of two quantities.
  (4) Sum of two cubes divisible by sum of quantities.
  (5) Differences of two cubes divisible by difference of quantities.
  (6) Binomial theorem.

4. Factors and Multiples.
  (1) Definitions.
    a. Factor.
    b. Multiple.
    c. Radical.
  (2) Cases of factoring.
    a. Where terms have common monomial factor
    b. Where expression is sum of two or more binomials which have common factor
    c. A perfect trinomial square.
    d. The difference of two squares.
    e. An expression which can be formed into the difference of two squares as: $X^4+X^2Y^2+Y^4$.
    f. Trinomials in the form of X^2+AX+B.
    g. The sum or difference of two cubes.
    h. The sum or difference of two equal odd powers.
  (3) Highest common factors.
    a. Definitions.
      (a) Common factor.
      (b) Highest common factor.
    b. Principles.

c. Cases.
(a) By inspection.
(b) Polynomials which cannot be factored by inspection.

(4) Least common multiple.
a. Definitions.
(a) Common multiple.
(b) Least common multiple.
b. Principles.
c. Cases.
(a) By inspection.
(b) Polynomials which cannot be factored by inspection.

5 Fractions.
(1) Definition.
(2) Terms.
(3) Kinds.
(4) Principles.
(5) Operations.
a. Reduction.
b. Addition.
c. Subtraction.
d. Multiplication.
e. Division.
f. Complex fractions.

6. Simple equations.
(1) Definitions.
a. Equation.
b. Root of equation.
c. Numerical equations.
d. Literal equations.
(2) Properties.
a. Addition.
b. Subtraction.
c. Multiplication.
d. Division.
(3) Principles of transposition.
(4) Kinds.
a. One unknown quantity.
b. Two or more unknown quantities.
c. Simultaneous equations.
(5) Eliminations.
a. Addition and subtraction.
b. Substitution.
c. Comparison.
d. Undetermined multipliers.

(6) Discussions.
- a. Indeterminate equations.
- b. Impossible equations.
- c. Negative results.
- d. Variables and limits.
- e. Theorem of limits.
- f. Inequalities.

7. Involution.
   (1) Definition.
   (2) Binomial theorem.
8. Evolution.
   (1) Definition.
   (2) Evolution of monomial.
   (3) Square root of polynomials.
   (4) Square root of numbers.
   (5) Cube root of polynomials.
   (6) Cube root of numbers.
   (7) Any root of polynomials.
   (8) Any root of numbers.
9. Theory of exponents.
   (1) Meaning of $A^{\frac{n}{z}}$
   (2) Meaning of A^{o}
   (3) Meaning of A^{-n}, etc.
10. Surds.
   (1) Definitions.
   (2) Kinds.
      - a. Similar.
      - b. Dissimilar.
   (3) Operations.
      - a. Reduction.
      - b. Addition.
      - c. Subtraction.
      - d. Multiplication.
      - e. Division.
      - f. Involution.
      - g. Evolution.
   (4) Properties of quadratic surds.
   (5) Equations containing quadratic surds.
   (6) Irrational numbers.
11. Imaginary numbers.
   (1) Definition.
   (2) Fundamental operations.

12. Quadratic equations.
    (1) Definition.
    (2) Kinds.
        a. Pure equations.
            (a) Definition.
            (b) Method of solution.
        b. Affected quadratics.
            (a) Definition.
            (b) Methods of completing square.
            (c) Literal quadratics.
            (d) Theory of quadratic equations.
            (e) Equations solved like quadratics.
            (f) Simultaneous quadratic equations.
13. Ratio and proportion.
    (1) Definitions.
        a. Ratio.
        b. Proportion.
        c. Mean proportional.
        d. Third proportional.
        e. Fourth proportional.
        f. Continued proportional.
    (2) Properties.
14. Variation.
    (1) Definition.
    (2) Signs.
    (3) Principles.
15. Progressions.
    (1) Arithmetical.
        a. Definition.
        b. Terms.
        c. Principles.
    (2) Harmonical progression.
        a. Definition.
        b. Principles.
16. Theorem of undetermined coefficients.
17. Logarithms.
    (1) Definition.
    (2) Characteristics.
    (3) Mantissa.
    (4) Properties.
    (5) Uses.
        a. Involution.
        b. Evolution.
18. Binomial theorem.
    Give proof for any positive integral expression.

PHYSICS.

Physics is not to be considered as a series of disconnected subjects, but a body of well organized truth forming a symmetrical whole. Its treatment should be such as to show this relation and not a disjointed group of subjects—mechanics, sound, heat, light and electricity.

"The phenomena of physics are those of natural life. The fund of facts and illustration is already largely in the possession of the pupil. The study of physics should systematize and co-ordinate them and give the pupil ability to use the knowledge acquired."

The "shorthand" of algebraic formulæ is helpful, and should be employed, but the pupil should use no formula until he can develop it.

The science of physics has been developed almost entirely by experiment and observation. The natural way to study physics is by means of experiment and observation,—laboratory work by the pupil.

The class work should consist of recitation from the text, explanation and expansion of difficult matter by the teacher, and illustration of the principal phenomena by means of apparatus from the lecture table, and solution and discussion of problems. Questions in recitation and examination should be such as bring out and develop the pupil's reasoning powers rather than a test of memory.

The laboratory work should be largely quantitative. Illustrative experiments should be mostly by the instructor in the development of the lessons. The pupil should have such instruction as will enable him to understand what he is seeking to accomplish, and such questions as will lead him to a comprehension of the principles involved and their relation to the class work, thus making the class and laboratory a unit.

Sixteen pupils in a laboratory and thirty in a class should be the extreme limit of numbers. Accurate records of processes, results, and conclusions should be kept by each pupil and these records should be in the pupil's own language and not copied from a book or instruction sheet.

A course of one year in physics is the minimum in which it can be treated even in a very elemetary manner. A year and a half should be given to the subject where possible. Approximately one half of this time should be devoted to laboratory work.

No school should attempt instruction in physics without a teacher well grounded in the principles of the subject-matter and familiar with the laboratory methods, and a laboratory well equipped for demonstrating and testing the principles and laws that are developed in the text. No laboratory is complete without a shop equipped with a lathe for wood and iron, a set of wood working tools, some iron working tools and a soldering outfit.

OUTLINE.

I. Introduction.
- 1. Classification of subjects.
- 2. Properties of matter.
  - (1) Universal.
  - (2) Special or characteristic.

II. Position.
- 1. Methods of locating a particle in a plane.
  - (1) By abscissa and ordinate (geographical and astronomical).
  - (2) By giving the direction and length of the line connecting the particle with the point of reference.
- 2. Location of a particle in space.

III. Units.
- 1. Fundamental units.
  - (1) Length, mass, time.
- 2. Derived units.
  - (1) Surface, volume, speed, acceleration, etc.
- 3. Systems.
  - (1) English and Metric.

    (The various derived units should be taught as they are needed in the development of the topics).
- 4. Methods of measuring length.
  - (1) Vernier, micrometer, spherometer.

IV. Motion.
- 1. How described.
- 2. Kinds.
  - (1) Uniform motion.
    - a. Speed, velocity. (Scalar, Vector.)
  - (2) Variable.
    - a. Acceleration.
      - (a) Direction constant, speed variable.
        - 1. Development of formula.
      - (b) Speed constant, direction variable. (Uniform motion in a circle.)
  - (3) Simple harmonic motion.

V. Relation between force, mass and motion.

1. Definitions of units.
2. Newton's laws of motion.
3. Relation between force, mass and acceleration.
4. Composition of forces, graphical representation.
5. Gravitation.
   - (1) Laws.
   - (2) Center of mass
     - a. Equilibrium.
   - (3) The pendulum.
     - a. Laws.
     - b. Uses.
6. Moment of force.

VI. Energy and work.

1. Energy—definition, unit.
   - (1) Kinds—kinetic, potential.
   - (2) Conservation and correlation.
   - (3) Relation between energy and work.
2. Work defined and its unit compared with unit of energy.

VII. Application of the principles of energy to machines.

1. Machines, simple and compound. (Examples of simple machines.)
   - (1) General laws. (Conservation of energy.)
   - (2) Mechanical advantages.
   - (3) Efficiency.
2. The balance.

VIII. Mechanics of fluids.

1. Definition of fluids, liquid, gas.
2. Atmospheric pressure.
   - (1) Measurement of barometer—aneroid and mercurial.
3. Relation between pressure and volume. Boyle's law.
4. Air pump and its uses.
5. Upward pressure, and its cause.
   - (1) Specific gravity.
6. Siphons and pumps.
7. Surface tension.
   - (1) Cause; uses in nature.

IX. Elasticity.

1. Its universality.
2. Elasticity of size and shape.
3. Coefficient.
4. Vibrations due to elasticity. (Wave motion within a substance.)
5. Waves; definition and kinds of motion.

X. Sound.

1. Nature; definitions; distinction between sound and hearing.
2. Propagation.
   - (1) Speed in various media.
   - (2) Reflection and refraction.

3. Properties.
   (1) Pitch, how varied.
   (2) Quality.
   (3) Intensity.
   (4) Interference and beats.
4. Musical scale; harmony.
5. Vibration in strings; laws of.
6. Vibrations in air columns.
7. Methods of studying sound waves.
   (1) Manometric flame.
   (2) Kundt's tube.

XI. Electrostatics.

1. Fundamental phenomena.
2. Electrofaction and electric field.
3. Conductors and insulators.
4. Electrofaction, a form of energy; how produced, how detected.
5. Potential and difference of potential.
6. Condensers and their capacity.
7. Electrostatic induction; distribution of charge; the electroscope.
8. Electrophorous and electric machines.

XII. Current electricity.

1. Two methods of producing electric currents.
   (1) The voltaic cell.
      a. Conductors of first and second class.
      b. Arrangement of conductors in a cell.
      c. Some of the practical forms of voltaic cells.
   (2) Faradayic, or cutting lines of force—induced currents.
      a. Various illustrations of induced currents.
      b. Primary and secondary currents.
         (a) Transformer and dynamo.
2. Effects of the electric current.
   (1) Electrolysis.
      a. Illustrations.
      b. Faraday's Laws of Electrolysis.
         (a) Unit of current, the Ampere.
   (2) Heating effects.
      a. Illustrations and laws of heating.
      b. Cause of heating, electrical resistance.
         (a) The unit of resistance, the Ohm.
   (3) Magnetic effects.
      a. Illustrations.
      b. Electromagnets, galvanometers, motors.
3. Ohm's law and its application; electromotive force; volt.

XIII. Magnetism.

1. Definitions of parts of magnets, of kinds of magnets.
2. Leading facts of magnetism.
   (1) A pivoted magnet takes a certain direction. Mariner's compass.

(2) The magnetic meridian varies on different parts of the earth's surface and on the same part from time to time.
(3) Magnetic dip.
(4) Attraction and repulsion between poles.
(5) Magnetic field, lines of force.
(6) The earth itself a great magnet.
(7) The earth's action a couple.
(8) Magnetic quality disappears at red heat.
(9) Magnetization a molecular property.
(10) Magnetic induction.

XIV. Heat.

1. Definition of heat; sources; effects.
2. Temperature and instruments for measuring temperature.
3. Distribution; conduction and radiation, aided by the mechanical process of convection currents.
4. Expansion and expansion coefficients.
5. Laws of change of state.
6. Calorimetry; unit of heat; specific heat and latent heat.
7. Thermodynamics; relation between heat and work, steam engine.

XV. Light.

1. Medium and nature of light.
2. Velocity and intensity of light; photometry.
3. Reflection and refraction; mirrors and lenses.
4. Interference and its attending phenomena.
5. Dispersion.
   (1) Spectra.
      a. Spectroscope and its use.
6. Optical instruments: microscope, telescope, camera, projection-lantern.

ECONOMICS.

A free government depends for its existence upon the intelligence of its people. The future history of our country will depend to a great degree upon a general diffusion of correct political and economic principles.

Students who can master the principles of geometry and solve quadratic equations will have no difficulty in grasping the ideas presented in the elements of this subject. When students arrive at the age when they take upon themselves the duties of an American citizen at the ballot box, or in influencing those that do, they should be capable of making broad and sensible judgments on all important economic questions.

To this end it is assumed that reference will be made constantly to the works, on economics, mentioned elsewhere in this manual, whatever work be made the basis for use in the classroom.

OUTLINE.

I. **Preliminary and historical.**
   1. Definitions of economics compared.
   2. Four departments named, defined, and briefly discussed.
   3. Two kinds of consumption—Final and productive.
   4. Consumers—Definition.
      (1) Unproductive.
         a. Defectives.
         b. Parasites.
      (2) Productive.
         a. Giving material services.
         b. Giving personal services.
   5. Occupations.
      (1) Unproductive.
      (2) Productive.
         a. Extraction.
         b. Transportation.
         c. Transformation.
         d. Transfer or trade.
         e. Personal service.
         f. Illustrations and discussions.

II. Wants of man.

1. As to importance and abundance of living.
   (1) Necessities.
   (2) Comforts.
   (3) Luxuries.
2. As to origin and quality of living.
   (1) Physical.
   (2) Intellectual.
   (3) Moral.
   (4) Spiritual.
   (5) Social.
   (6) Aesthetic.
3. Civilization—The process of developing new wants and means of satisfying them.
   (1) Material civilization.
   (2) Moral civilization.

III. Economic History—Relation to material civilization.

1. Stages.
   (1) Hunting and fishing.
   (2) Pastoral or herding.
   (3) Agricultural.
   (4) Commercial and manufacturing.
   (5) Industrial or factory.
   (6) Trust or monopoly.
   (7) Characteristics of each stage.
   (8) Illustrations of each, taken from history.
2. Migratory and home periods.

IV. Competition—Nature.

1. Importance in economic science and life.
2. Free and restrained competition.
3. Tests of all rights—(Interference with the rights of others—The public good).
   See Ely's outlines, page 257.
4. Governmental interference.
   (1) Just examples.
   (2) Unjust examples.
5. Other obstacles to free competition.

V. Fundamental definitions.

1. Utility, definition.
   (1) Not so much a quality residing in the thing as a relation between things and persons, and therefore relative and variable.
   (2) Utility to the individual—Individual or personal utility.
   (3) Utility to society—Social utility.

2. Goods—Definition—Essential attribute.
   (1) Internal (or subjective).
   (2) External (or objective).
      a. Free.
      b. Economic.
         (a) Wealth (material).
         (b) Personal service (apparently immaterial).
         (c) Representative goods, e. g., mortgages, deeds, etc.
3. Wealth—Definitions.
   (1) Essential characteristics.
      a. Utility.
      b. Transferability.
      c. Difficulty of attainment (scarcity).
      d. Materiality and possession or ownership implied in transferability.
      e. Value i. e., the worth in other things, the purchasing power, implies all three of the above essentials.
   (2) Comparison of.
      a. Goods and wealth.
      b. Utility and value.

N. B. The discrimination between these terms is very important.

   (3) Classification of goods according to use.
      a. Consumption goods. Definition and examples.
      b. Production goods. Definition and examples.

VI. Production. Define.

1. Agents of.
   (1) Land (or nature).
   (2) Labor.
   (3) Capital.
2. Which are essential or primary? Explain. Which is secondary?
3. Further analysis of labor agent.
   (1) Labor (in ordinary sense).
   (2) Business management.
   (3) Government protection.
4. Shares to each agent.

VII. Land Definition.

1. Identity with nature.
2. Two forms.
   (1) Material—e. g., trees, water, air, etc.
   (2) Forces—e. g., gravity, vital force, cohesion, etc.
3. Constant in quantity.
4. Variable in quality.
   (1) Hence rent.
5. Law of diminishing returns.
   (1) Ways of postponing the point of diminishing returns.
   (2) Relation of the law to population.
   (3) Relation of the law to agriculture.
   (4) Relation of the law to manufactures.
6. Is there a law of increasing returns.

VIII. The Malthusian Doctrine.

1. Rate of increase in
   (1) Population.
   (2) Products.
2. Probability of general starvation.
3. The other side.
   (1) Effect of civilization on
      a. Increase of population.
         Illustrated from U. S. Census.
         Illustrated from French history, etc.
      b. Increase of products.
         Compare early English and modern crops.
         Compare ancient and modern manufactures.

IX. Labor. Definitions.

1. Primitive form (see Clark's Philosophy of Wealth, page 10).
2. Labor and services.
3. Classes of laborers.
   (1) Wage earners.
   (2) Undertakers (Entrepreneurs, proprietors).
      a. Non-employing (Antonomous producers).
      b. Employing undertakers.
      c. Examples of each.
4. Wages.
   (1) Necessary profits or wages of superintendence.
   (2) Pure profits.
5. Division of labor.
   (1) Advantages.
   (2) Disadvantages.
6. Efficiency of labor.
   (1) Causes of difference in efficiency.
   (2) Lessons for employers.

X. Capital. Definition.

1. Identical with production goods (?).
2. Is all wealth capital?
3. Forms of capital.
   (1) Subsistence.
   (2) Tools.
   (3) Material.
   (4) Illustrations.
      a. Is substance capital?
4. Kinds of capital.
   (1) Fixed.
   (2) Circulating.
   (3) Principle touching the relation of the two.
5. The law of capital.
   (1) Discussion of same.
   (2) The influence of capital on production with illustrations from history.

XI. Exchange. Definition.

1. Three instruments or modes of exchange.
2. Definitions and illustrations.
3. Difficulties of barter.
4. Money.
   (1) Origin, etc.
5. Credit.—Definition.
   (1) Kinds.
6. Money.
   (1) Essential characteristics.
   (2) Discussion of each.
   (3) Functions of money.
   (4) Definitions.
   (5) Deferred payments.
   (6) Tabular standard.
   (7) Three conceptions of money—Ely, p. 140.
      a. Popular.
      b. Legal.
      c. Economic.
   (8) Definitions and illustrations.
   (9) Coin money.
      a. Kinds.
      b. Bimetallism.
      c. Gresham's law.
      d. History of coinage.
10. Paper money of the United States.
   (1) Brief history.

XII. The law of value.

1. Value as affected by supply. (Cost of production.)
2. As affected by demand.
3. The equation of supply and demand.
4. The marginal producer or seller.
5. Marginal consumer or purchaser.
6. Law of value by English school.
7. Law of value by Austrian school.

XIII. Distribution.

1. Definition.
2. Table showing.
   (1) Agents.
      a. Land.
      b. Labor.
         (a) Labor proper.
         (b) Business management.
         (c) Government protection.
      c. Capital.
   (2) Sharers.
      a. Landlord.
      b. Wage earners.
      c. Proprietor or undertaker.
      d. Society.
      e. Capitalist.

(3) Portions.
a. Rent.
b. Wages.
c. Profits.
d. Taxes.
e. Interest.

XIV. The capitalist's share.

1. The law of interest.
2. Influence of supply and demand.
   (1) Interest in a new country with little capital.
   (2) Interest in an old country with much capital.
   (3) Tendency of rate to fall.
   (4) Effect of usury laws.
3. Law of interest—rate determined by productivity of capital to marginal (least competent) borrower.

XV. Law of wages.

1. Wages.
   (1) Upper.
      a. The full product of labor.
   (2) Lower.
      a. The standard of life—*i. e.*, what will maintain the laborer and his family in effective working condition.
2. Rate determined by the productivity of labor to the marginal employer.
3. Variations from this law caused by imperfect competition.
   (1) Governmental interference, examples from history.
      a. Statute of laborers, etc.
      b. Combinations, laws.
   (2) Combinations of employers.
      Examples—e. g., among coal miners.
   (3) Weakness and timidity of workmen unable to assert themselves—e. g., school teachers, etc.
   (4) Custom.
      a. Examples from early history.
4. The effect of women's and children's labor on the rate of wages.
5. Women's wages.
   (1) Why lower than men's.
   (2) Influence of.
   (3) Productivity.
   (4) Cost of maintenance.
      a. With no families to support.
      b. With parents furnishing home and frequently board.
      c. With less combination for mutual defense.
      d. With prospects of marriage in near future.

XVI. Law of rent.

1. Origin of rent in varying productivity of land.
   (1) Two elements in productivity.
      a. Fertility.
      b. Proximity to market.
2. Marginal land—land just good enough to pay for cultivating.
3. Law of rent—rent is determined by the excess of the productivity of any land over that of the marginal land. Problems.
4. Influence of modern transportation on rents.

XVII. Law of profit.

1. Profits as dependent on business management.
2. Profits caused by difference in business ability.
3. Profits and management of employers.
4. Profits measured by excess of productivity of any employer over that of the marginal employer (eutrepreneur problems).

XVIII. Unsatisfactory distribution and proposed remedies.

Monopolies as affecting distribution.

(1) Nature of monopolies.
   a. Partial.
   b. Public and private monopolies.
      (a) Examples of each.
   c. Temporary and local monopolies.
   d. Natural monopolies.
      (a) Nature and examples.
   e. Artificial or social monopolies.
      (a) Examples.
   f. Monopolies by combination with natural monopolies.
   g. Public ownership of natural monopolies.

XIX. Co-operation.

1. Distributive.
2. Productive.
3. Nature and history of distributive co-operation.
   (1) Advantages.
   (2) Success in America, in England.
4. Nature of productive co-operation.
   (1) Reasons for failure of pure productive co-operation.
   (2) Conditions favorable to success.
   (3) Examples of successful productive co-operation.

XX. Socialism.

1. Nature.
2. Essential tenets.
3. Scientific or evolutionary.
4. Revolutionary.
5. Socialistic phases of our present system.
6. Socialistic tendencies at present.

XXI. Anarchism.

1. Nature.
2. Confusion with socialism.

XXII. Communism.

1. Nature and history.
2. Communities, e. g. Amana.

XXIII. Trades Unions.

1. Nature.
2. History.
   (1) Origin in the merchant and crafts gilds.
   (2) Stages of development in England and the United States.
3. Advantages and service done to labor.
4. Disadvantages and dangers.
5. Question of incorporation.

XXIV. Arbitration.

1. Nature.
2. History.
3. Voluntary.
4. Compulsory.
5. Difficulties to be met.

Most of the difficulties of distribution to be settled only through the observance of the Golden Rule. Read Wright's Practical Sociology, pp. 424-25.

CIVICS.

The object of this work should be to develop a larger interest in civic history and problems, rather than to test a host of isolated facts. Great attention should be given to comparing parts of the organic law of the state and nation; little attention should be given to the changeable things in civics. The great danger of work in our schools, concerning civil government, is the possibility of giving too large attention to the mutable things, and not of differentiating from the permanent things. The chief end of this class work in secondary schools is to pay large attention to determining what is permanent and unchangeable, and what is mutable and variable. There are serious abuses in this direction that should not be overlooked in training teachers.

Large attention should be given to the historic development of our institutions, and much collateral reading should be required of those, who are preparing to teach this important subject.

OUTLINE.

I. Local government in Iowa.
   (1) The township and the municipality.
   (2) The county and its functions.
II. The state government—general view.
III. The functions of the executive department.
IV. The functions of the legislative department.
V. The functions of the judicial department.
VI. The public institutions of Iowa.
VII. The fiscal transactions and expenditures.
VIII. Relations of the state to the general government.
IX. Management of education in Iowa.
X. The United States constitution as a whole.
XI. The president.
XII. The house of representatives.
XIII. The senate.
XIV. The district and circuit courts.
XV. The supreme court.
XVI. How are laws made?
XVII. Elections.
XVIII. The territorial system.
XIX. The limitations of the union, and of the states.

IOWA SCHOOL LAW.

There is no more important subject for the Iowa teacher than the Iowa school law. An acquaintance with the statutes and decisions which directly concern the teacher, will preserve harmony in the district and render more effective the teacher's work.

A mastery of the subject here outlined should give to the teacher and prospective teacher a more intelligent view of the legal rights and duties of school officers, teachers, patrons, and pupils. To the end that greater intelligence in matters of education will lead to better co-operation of officer, teacher, patron and pupil, this subject is given a place in this outline.

Only the important matter is suggested; the method of presenting it is left to the teacher.

IOWA SCHOOL LAW.

I. School districts.
- 1. Kind.
  - (1) The school township.
    - a. Corporate rights and privileges.
    - b. Electors and elections.
    - c. Territorial limitations.
    - d. Meetings of the corporation.
    - e. Authority of said meeting.
    - f. School bonds.
    - g. Schoolhouse sites.
    - h. Subdivisions.
      - (a) Subdistricts.
        1. Meetings.
        2. Electors and elections.
        3. Authority of same.
  - (2) Independent districts.
    - a. Rural.
      - (a) Corporate rights and privileges.
      - (b) Electors and elections.
      - (c) Territorial limitations.
      - (d) Meetings of corporation.
      - (e) Authority of said meeting.
      - (f) School bonds and schoolhouse sites.

b. Urban.
(a) Corporate rights and privileges.
(b) Territorial limitations.
(c) Electors and elections.
(d) Meetings of corporation.
(e) Authority of said meetings.
(f) School bonds.
(g) Schoolhouse sites.

II. School boards.
1. Membership.
(1) Variety of directors as to different districts.
(2) Qualifications and term.
(3) Authority in session and otherwise.
2. Duties.
(1) As to the following:
a. Officers of board.
b. Bond of officers.
c. School warrants.
d. Certifying of taxes.
e. Limitations in taxation.
f. Rules and regulations for the schools.
g. Course of study.
h. Teaching of physiology.
i. Election of teachers.
j. Dismissal of teachers.
k. Contracts with teachers and others.
l. Visiting schools.
m. Text-books and supplies.
n. Shade trees, school sites, repairs, etc.
o. Kindergartens and other schools.
p. Claims against district.
q. Trials, etc., etc.

III. School teachers.
1. How licensed in Iowa.
(1) Kinds of certificates.
(2) Character of examinations.
(3) Value of license to a teacher.
(4) Penalty for not having license.
(5) Revocation of license.
2. The Normal institute.
(1) Why should teachers attend?
(2) Spirit and purpose.
3. Contracts.
(1) How made.
(2) How to withdraw legally and properly from contracts.
(3) Double contract—legally to the board, morally to every child in the district.

4. Reports.
   (1) To secretary of board.
   (2) To county or city superintendent.
   (3) To patrons of the school.
5. Records.
   (1) For the district.
   (2) For successor.
6. Obligations, legal and moral.
   (1) To the child.
   (2) To the parents.
   (3) To the school board.
   (4) To the superintendent.
   (5) To the profession.
7. Holidays and vacations.
8. Appeals to higher authority.
9. Good moral character—what is implied?
10. Attitude of the teacher.
    (1) Toward society.
    (2) Toward religion.
    (3) Toward morality.
    (4) In general toward the ideals of the community.

IV. The school patrons.

1. Residence rights.
2. Elective franchise.
3. Annual school meeting.
4. Schoolhouses.
5. Changing text-books.
6. Course of study.
7. Selling property.
8. Wards.
9. Schoolhouse fund surplus.
10. Schoolhouse tax.
11. Special meetings of the people.
12. Conduct of a school election.
13. Registration of voters.
14. Appeals from action of board.
15. Rights as to the course of study.
16. Children on the way to and from school.
17. Rights of patrons regarding suspension and expulsion of children.
18. Non-resident children and their parents.
19. Religious instruction.
20. Condemnation of school sites.

V. The pupil.

1. Legal age.
2. Rights of attending school.
3. What has he a right to study?
4. Who says where he must begin each term?
5. When attend school in another district?

6. Physiology and hygiene.
7. Obey rules and regulations.
8. Transportation of.
9. Indigent pupils and school books.
10. Reading bible.
11. Free text-books.
12. Purchase text-books.
13. Punishment for offenses.
14. Suspension, etc.
15. Tardiness.
16. Attendance bad.
17. When is corporal punishment not legal?
18. Over age, how attend school?
19. Rights on the streets and highways.
20. For what responsible to the teacher regarding matters outside of school hours?

VI. The school superintendent.

1. Varieties of supervision allowed by law.
   (1) State.
   (2) County.
   (3) City.
   (4) School board.
2. Authority for city superintendent's selection.
3. Who can be a city superintendent?
4. Duties of city superintendent.
5. Province of said officer.
6. Power to dictate.
7. Power to govern.
8. General duties—how determined?
9. Why employed only in independent districts?
10. Visiting schools
11. Holding teachers' meetings, etc.

VII. The county superintendent.

1. Other official positions.
2. Qualifications.
3. Selection, how made?
4. Under whom and to what extent.
5. Visitation of schools.
6. Authorizing persons to teach.
7. Revoking certificates.
8. Normal institute.
9. Report to whom and about what?
10. Salary.
11. Schoolhouse plans.
12. Condemning school sites.
13. School trials.
14. County board of education.
15. Authority when visiting schools.
16. Educational meetings.

17. Responsibility for success of schools.
18. Limits of his services that are reasonable.
19. Magnitude of his work.
20. Qualifications essential.

VIII. General matters.

1. State superintendent.
2. State board of educational examiners.
3. The state schools and their educational province.
4. Deficient sight and hearing, etc., of pupils, and rights in such cases.
5. Women voting at school elections.
6. County high school.
7. Library in schools.
8. Apparatus for schools.
9. Oath of school officers.
10. School month.
11. School taxes—limits.
12. School orders and their negotiability.

VOCAL MUSIC.

The future of general music development lies largely in the hands of the public school teachers. The patrons of the schools are anxious to have their children enjoy the advantages of musical culture and they are willing that a reasonable amount of time be given to the subject. The urgent demand is that the teachers be given a thorough elementary course in vocal music. A study of methods for presenting music is highly desirable but it should not precede the important consideration of getting something to present. Only in proportion as we make musicians of our teachers can we reasonably expect to get music on its feet in the schools. In preparing teachers for their work in school music, there is a special necessity for emphasizing the important things and subordinating the unimportant. The limited time that can be given to the subject is not sufficient for complete preparation. A few things are to be mastered; others treated incidentally; while a considerable part of the subject must be merely touched upon or omitted. Learning to read music by the use of the syllables, Do, Re, Mi, etc., should be strongly emphasized during the teachers' course. A considerable degree of skill is necessary on the part of the teacher if she is to develop enthusiasm on the subject in her class.

There are various devices for developing the sense of rhythm. As a foundation for mastering the subject of rhythm and becoming an independent reader, beating time with the hand ranks first. Every teacher should be able to beat time with an easy, rhythmical, sprightly movement. It takes persistent practice to acquire this skill.

As all progress in sight singing depends on ability to sing the intervals of the scale, the scale must be learned as a preparation for successful work. Ability to sing these intervals is as essential to the reader of music as the addition table is to the book-keeper.

Note reading as far as possible should be learned by the use of pleasing, musical songs rather than by merely mechanical exercises.

The essentials in the rudiments of music should be learned, not as isolated facts, but as parts of a related whole.

A good variety of songs suitable for school use should be learned. The singing of these songs furnishes opportunity for voice training and practice in the multitude of details that are involved in correct song interpretation.

Every song, note reading exercise, or scale drill, should be an exercise in voice culture and ear training. The habit of singing with soft musical tones, and with expression suitable to the words and music is of first importance for both teacher and pupils.

The following brief outline gives the general scope of the work that is expected to be done:

OUTLINE.

I. **Elements of music.**

1. Diagram major scale in form of ladder and note where half steps occur.
2. Diagram two octaves of keyboard of organ and learn names of both white and black keys.
3. Apply the major scale to keyboard. Place Do, or 1, of the scale on the various keyletters and note what sharps and flats are used, and why they are used, in the different keys.
4. Diagram the bass, and the soprano staff, connecting them with middle C, and learn the location of all the letters.
5. Diagram in a horizontal line all the notes in common use and put the corresponding rests directly under them.
6. Apply the major scale to the keyboard and write out the different keys on the soprano staff, (1) without signatures, (2) with signatures.
7. Illustrate by diagram one measure each of the different kinds of time in common use, and mark the accented beats.
8. In beating time with the hand, there are but three different movements to learn, namely:—"down, up," for double time; "down, left, up," for triple time; and "down, left, right, up," for quadruple time. In learning a song in $\frac{6}{8}$ time, it is well to beat "down, left, up; down, left, up,"—six beats for each measure—at first, but later, especially if the movement is quick, there should be but two beats in a measure.
9. To find the pitch for Do in the different keys by the use of a C pitch pipe, the following scheme is used:

   For key of G, call "C" Do and sing down to Sol, and call that Do.

   For key of D, call "C" Do and sing down to Re, and call that Do.

For key of A, call "C" Do and sing down to La, and call that Do.
For key of E, call "C" Do and sing down to Mi, and call that Do.
For key of B, call "C" Mi, and sing down to Do, and call that La, sing up to Do.
For key of F, call "C" Sol, and sing down to Do.
For key of B, call "C" Re, and sing down to Do.
For key of E, call "C" La, and sing up to Do.
For key of A, call "C" Mi, and sing down to Do.
For key of D, call "C" La, sing up to Do, call that Re, sing down to Do.

10. Write chromatic scales in all the keys.
11. Learn definitions of the ordinary terms used in music.
12. Introduce the minor scale (harmonic form). Show its relation to the major scale by means of ladders attached side by side, also by writing them on the staff.
13. Learn biographical sketches of leading musicians and outline of musical history, if time will permit.

II. Scale practice.

It is well known that teachers using the Tonic-sol-fa method have been able to do wonders in getting people in general, both children and adults, to read music at sight. The simplicity of the whole system has doubtless had much to do in producing these results; but the leading principle is that the pupil is led to feel the special character of each sound in the scale.

The problems in learning to read music are substantially the same whether the music be written on a staff, or written without the staff as in the Tonic-sol-fa system. The pupil must learn to recognize notes and be able to think the tones represented by those notes before he can read music at sight. Experience proves that the real test in sight singing is to be able to think the correct tones immediately after seeing the notes. Success in this depends on thoroughly mastering the scale.

Each tone in the scale has characteristics peculiar to itself. It will add greatly to the interest and the effectiveness of the work to have the class recognize these characteristics, and express them by singing the tones. Do is the foundation tone, the home tone. It is characterized by strength. Re is full of promise, life, and courage. It is the optimistic tone. Mi is quiet, soothing, and restful. It is the lullaby tone. Fa is grand, awe inspiring, infinite. Sol is bright, rousing, triumphant. La is plaintive, sad. It is called the weeping tone. Si (or Ti) is sensitive, incomplete. It reaches up to Do.

In having pupils express the qualities of the different tones as they sing them, there is a fine opportunity to lead them into artistic singing. Take the syllable "Mi," for example. If a class merely think of its being a sound a step higher than Re, they may sing it with a lifeless "throaty" tone wholly devoid of musical feeling, but let them try to express sympathy for a suffering friend by singing that syllable, and at once they are transformed into a new class. The harsh tones

are softened, the lifeless tones vitalized; in short, noise has been supplanted by music.

There should also be a diagram of the major scale put on the board in the form of a ladder with the syllables Do, Re, Mi, etc., written on the round. A spirited drill in skips in the scale should be conducted from this for a few minutes at every session, until great skill is acquired.

The following are some of the devices that may be used, the teacher indicating with the pointer the notes to be sung. Every exercise should end in Do. The prime mark after Do (Do') indicates that upper Do is to be sung. Work should be continued on this until the class can sing the entire series accurately from memory:

1. Do, Mi, Sol, Mi (three times).
2. Do', Sol, Mi, Sol (three times).
3. Do, Fa, La, Fa (three times).
4. Do', La, Fa, La (three times).
5. Do, Mi, Sol, Mi, Do, Fa, La, Fa.
6. Do', Sol, Mi, Sol, Do', La, Fa, La.
7. Do, Re, Do, Mi, Do, Fa, Do, Sol, Do, La, Do, Si, Do', Do.
8. Do', Si, Do', La, Do', Sol, Do', Fa, Do', Mi, Do', Re, Do', Do.
9. Do, Re, Do, Re, Mi, Re, Mi, Fa, Mi, Fa, Sol, Fa, Sol, La, Sol, La, Si, La, Si, Do'.
10. Do', La, Si, Do', Sol, La, Si, Fa, Sol, La, Mi, Fa, Sol, Re, Mi, Fa, Do, etc., etc.

Another device for giving variety to scale drill is to place the numbers 1, 2, 3, 4, 5, 6, 7, 8, on the board without regard to order, point to the numbers and have pupils sing the corresponding tones.

Singing familiar tunes from memory, using the syllables Do, Re, Mi, etc., makes an interesting diversion occasionally, and affords the finest kind of practice.

III. Sight singing.

The paramount aim in school music is to have the masses of the pupils learn to read music at sight. When this is done the way will be paved for having real music in the home, the school, and the church, instead of using the silly claptrap stuff that is so vigorously crowded upon the market. Note reading should not be considered merely as something to teach to children, but as the key which is to unlock to the masses the store house of rich music that has been bequeathed to them by the masters. Note reading should occupy more than half of the entire time devoted to music in a teachers' course until the students can read music independently.

IV. Song interpretation.

Generally, miscellaneous song singing, unless directed toward specific ends, is rather an unprofitable occupation for music classes, for the precious moments in which so much might be done are spent, not in acquiring skill for future use, but merely in working off energy. But when songs are sung with spirit and with artistic finish, the exercise becomes the crowning feature of all public school music work.

ELEMENTARY PSYCHOLOGY.

The teacher works with mind. It therefore becomes necessary that he understand the nature of mind and its modes of activity that he may work in accord with them, for the best results. The following outline indicates the parts of the subject, the knowledge of which is believed to be essential that he may be an intelligent worker in the schoolroom. Such knowledge will not only enable him to judge of his methods and devices, but will give him power of adaptation and make him an increasingly interested student of child life and keep him a zealous and growing teacher.

OUTLINE.

I. General.

1. Knowledge of mind as an aid in teaching.
2. Mind and body—Physiology of the nervous system in its general functions. Conditions of body as affecting the mental life. Mental conditions as influencing bodily activity.
3. How to study the mind—objective method; subjective method; advantages and disadvantages of each. How to observe children—value of genetic psychology to the teacher.
4. Consciousness; varying states of; threshold; subconsciousness; evidences of; relation to conscious life.

II. Knowledge process.

1. Attention; kinds; physical signs of laws; obstacles to; rise of voluntary from involuntary; relation to study; relation to memory; training of.
2. Interest; nature of; natural and acquired; relation to study; teacher's use of.
3. Apperception; how the mind relates experiences; assimilative power as affected by age, sex, environment.

III. Knowing.

1. Sensation—Physiological and psychical elements; differences of quantity and quality; relative value of the different senses; knowledge obtained through each.
2. Perception. Elements of; what the child perceives; fusing of knowledge given by different senses; training to observe; cultivating quick perception; ideas of self, time, space, distance, etc.

3. Sense Training. Why; how; psychological principles underlying work of the Kindergarten and primary grades; how related to nature life; nature study; objects and methods.
4. Imagination. Mental image; formation; character of; clear; indistinct; relation to action.
5. Memory. Association of ideas; laws of; as depending upon physical condition and attention. Training the memory; mechanical memory.
6. Constructive imagination. Rise and growth in children; workings in invention and art; training of in school.
7. The Concept. Formation of general notions; as related to language and studies. Methods of teaching.
8. Judgment. Elements of; kinds, training in recognition of relations; common sense.
9. Reasoning. The syllogism; induction; uses and limits; deduction, when of value; dangers; use of analogy.

IV. Feeling.

1. Nature of pleasure and pain.
2. Bodily feelings; hunger; thirst; langour, etc. The relation to the higher mental life and to the work of the teacher.
3. Egoistic. Origin, growth, uses and training in control of anger, fear, jealousy, rivalry, love of power, etc.
4. Altruistic—love, sympathy, friendship; purpose of; their educational value; principles in cultivating.
5. Sentiments—nature of love of truth; love of the beautiful; love of the good; how formed and values as end in education.

V. Will.

1. Classify actions; uses of reflex and instructive acts.
2. Imitation. Tendency to imitate; uses made of it.
3. Idea-motor activity. In relation to development, self-control, skill, belief, character.
4. Deliberate action. Incentives and motives, choice; growth of child in self-direction through.
5. Discipline—habit. How formed; a help or a hindrance; laws of; character.

PHYSICAL SCIENCE EQUIPMENT.

(In order to be prepared to teach physics creditably the following minimum equipment is necessary.)

It is presumed that the school has a laboratory properly equipped with suitable tables and that there is free access to the common bench tools used by carpenters, tinners, and machinists, also a lathe for wood and iron. The laboratory equipment should be sufficient to supply an entire class in many of the exercises. Where it is convenient many pieces may be made by the pupils.

The following list indicates the minimum of apparatus in kind. The quantity or number of duplicates will be determined by the size of the school.

OUTLINE.

I. **Miscellaneous supplies.**

1. Glass and rubber tubing, assorted sizes.
2. Wire—brass, iron, copper (insulated), German silver.
3. Sheet copper, iron, zinc, brass, tin, glass.
4. Glass chimneys.
5. Tin foil, gold leaf.
6. Beeswax, paraffine, sealing wax.
7. Alcohol, sulphuric acid, hydrochloric acid.
8. Sal-ammoniac, copper sulphate, mercury, glycerine.
9. Sodium bichromate, gasoline.
10. Alcohol lamp or Bunsen burner.
11. Glassware—tumblers, funnel, graduate, beakers, test tubes flasks.
12. Corks, rubber stoppers, binding posts, ring stands.
13. Small masses of copper, lead, zinc, brass.

II. **Measurements.**

1. Meter rod.
2. Calipers—double.
3. Micrometer and vernier calipers.
4. Spherometer.
5. Dividers.
6. Trip balance with weights.
7. Beam balance with weights.
8. Diagonal scale.
9. Protractor.
10. Draw scale.

11. Regular blocks of wood.
12. Metal cylinders.
13. Marbles.
14. Heavy lead or iron weights.

III. Mechanics.

1. Pendulum.
2. Levers.
3. Incline plane with carriage.
4. Protractor.
5. Iron weights.
6. Centrifugal hoop with rotator.
7. Hydrometer.
8. Siphon.
9. Lifting pump.
10. Jolly's balance.
11. Sp. gravity balance.
12. Air pump with bell jar and usual accessories.
13. Magdeburg hemispheres.
14. Barometer tubes.
15. Mercurial barometer.
16. Aneroid barometer.

IV. Heat.

1. Thermometers—air and mercurial.
2. Ball and ring for expansion.
3. Linear expansion apparatus.
4. Blast lamp.
5. Calorimeter.
6. Newton's law of cooling apparatus.

V. Sound.

1. Set of tuning forks.
2. Savart's wheel.
3. Violin bow.
4. Siren disk with rotator.
5. Vibrating plate.
6. Organ pipe.
7. Resonator tubes.
8. Sonom-ter.
9. Kundt's tube; and Manometric flame apparatus if gas is available.

VI. Light.

1. Plane, concave and convex mirrors.
2. Prism.
3. Colored glass plates.
4. Nicol's prism.
5. Set of lenses.
6. Iceland spar.
7. Color disks.
8. Camera—(pin hole or lens).
9. Spectroscope and accessories.
10. Photometer.
11. Port Lumière or Solar Lantern.

VII. Magnetism.

1. Bar magnet.
2. Horseshoe magnet.
3. Mounted magnetic needle.
4. Iron filings, watch springs.
5. Electro magnet.
6. Magnetoscope.

VIII. Static electricity.

1. Rods of glass, wax, vulcanite.
2. Gold leaf electroscope.
3. Leyden jar and discharger.
4. Static machine and accessories (Toepler-Holtz)
5. Bell chimes.
6. Insulated hollow cylinder.
7. Electric whirl.
8. Geissler tubes.
9. Insulated stool.

IX. Current electricity.

1. Simple voltaic cell.
2. Two fluid cell—Daniell.
3. Gravity cell.
4. Leclanche cell—liquid and dry.
5. Grenet or plunge battery.
6. Edison-Lalande battery.
7. American storage cell.
8. Small primary and secondary coil.
9. Magneto-induction coil.
10. Simple dynamo.
11. Simple motor.
12. Incandescent lamps.
13. Water electrolysis apparatus.
14. Oersted's law apparatus.
15. Parallel current apparatus.
16. Microphone.
17. Telegraph set—key, sounder and relay.
18. Telephone—transmitter, receiver.
19. Galvanoscope.
20. Tangent galvanometer.
21. Astatic galvanometer.
22. Wheatstone's bridge—slide form.
23. Set of known resistances.
24. Resistance box.
25. Voltmeter.
26. Ammeter.
27. Electric bell.
28. Commutator.
29. Gassiot's cascade.

The equivalent of many of these pieces of apparatus may be homemade.

THE LIBRARY.

Under the heading, "General Regulations," the required number of volumes has been determined. All accredited schools must have standard reference works treating of subjects required in the course of study. The board recommends that the following publications or their equivalents be placed in libraries of accredited schools for collateral reading along the lines of civics, economics, and pedagogy:

CIVICS.

Alton, Edmund.....Among the Law-Makers..... Scribner.
Adams, H. C.....Science of Finance.....Henry Holt & Co.
Bryce, James.....Am. Commonwealth.....Macmillan Co.
Chandler, George ...Iowa and the Nation..... ....Flanagan Co.
Commons, J. R.....Proportional Representation..T. Y. Crowell & Co.
Conklin, Viola .....Am. Political History .....Henry Holt & Co.
Conner, J. F.....Uncle Sam Abroad.....Rand McNally & Co.
Dawes, A. L.....How We are Governed.....Ginn & Co.
Dole, C. F.....The American Citizen.....D. C. Heath & Co.
Dole, C. F.. .....The Young Citizen .....D. C. Heath & Co.
Dole, E. T.....Talks About Law .....Houghton, Mifflin & Co.
Daniels, W. M..... Elements of Public Finances..Henry Holt & Co.
Fiske, John.....Civil Government.....Houghton, Mifflin & Co.
Fiske, John.....Critical Period of Am. History. Houghton, Mifflin & Co.
Gordon, Jane.....Patriotism in Prose and Verse. Ed. Pub. Co.
Harrison, B. T.....This Country of Ours .....Scribner.
Hart, A. B.....Actual Gov't as Applied under
Am. Conditions.....Longmans, Green & Co.
Hinsdale, B. A.....The Am. Government.....Werner.
Hill, Mabel.....Liberty Documents.....Longmans, Green & Co.
Johnson, A.....American Politics.....Little, Brown & Co.
James, J. A.....Gov't in State and Nation ....Scribner.
Judson, H. P.. .....The Young American .....Maynard, Merrill & Co.
Lalor, J. J.....Cyclopedia of Political Science. C. E. Merrill & Co.
Macy, Jesse .. ..Our Government ..... Ginn & Co.
Macy, Jesse.....American Politics.....Ginn & Co.
McCleary, J. F.....Studies in Civics.....American Book Co.
Martin, G. H. .....Text-Book of Civil Gov't U.S. American Book Co.
Mowry, W. A. .....Studies in Civil Government..Silver, Burdette & Co.
Peterman, A. L.....Elements of Civil Gov't.....American Book Co.

Perry, A. L.....Introduction to Pol. Ec.....Scribner.
Palgrave, R. H.....Dictionary of Pol. Ec.....Macmillan.
Ricardo, B.....The Works of Ricardo.....John Murray, London.
Roberts, E. H..... Government Revenue.....Houghton, Mufflin & Co.
Sidgwick, H .....Principles of Pol. Economy...Macmillan.
Sumner, W. G .....Protection in the U. S . .....Putnams.
Spahr, C. B.....Essay on Distribution and Wealth in U. S.....T. Y. Crowell & Co.
Thorpson, R. E.....Protection to Home Industry..D. Appleton & Co.
Thurston, H. W.....Economic and Industrial History .....Scott, Foresman Co.
Walker, F. A.....First Lessons in Pol. Ec.....Henry Holt & Co.
Walker, F. A.....Advanced Political Ec.....Henry Holt & Co.
Wright, Carroll D...Industrial Evolution in U. S..Flood & Vincent.
White, Horace.....Money and Banking..... Ginn & Co.
Wells, D. A.....Recent Economic Changes... D. Appleton & Co.

PEDAGOGY.

Arnold, Sarah L ....Waymarks for Teachers.....Silver, Burkette & Co.
Aiken, Catherine....Method of Mind Training.....Am. Book Co.
Baldwin, J .....School M'gm'nt and Methods.D. Appleton & Co.
Brooks, Edward.....Normal Methods of Training.Normal Pub. Co.
Boone, R. G .....Education in the U. S.....D. Appleton & Co.
Butler, N. H.... ...Education in the U. S.....J. B. Lyon & Co.
Bender, W. H .....The Teacher at Work.....A. Flanagan Co.
Calkins, A. A.....Primary Object Lessons .....Am. Book Co.
DeGarmo, Chas.....Herbart & Herbartans..... Scribner.
DeGraff, E. V... ...The Schoolroom Guide.....C. W. Bardeen.
DeGarmo, Chas .....The Essentials of Method ....D. C. Heath & Co.
Dewey, John.....The School and Society.....Univ. Chicago Press.
Dewey & Runyan....Elementary School Record...Univ. Chicago Press.
Greenwood, J. M ...Principles of Education Practically Applied ....D. Appleton & Co.
Gow, A. M.....Good Morals and Gentle Manners .....Am. Book Co.
Hall, G. Stanley ....Methods of Teaching History.D. C. Heath & Co.
Halleck, R. P.....Psychology and Psychic Culture .... Am. Book Co.
Jackman, W. S. ....Nature Study ....Henry Holt & Co.
Hodge, C. F..... ....Nature Study and Life. .....Ginn & Co.
Hewett, E. C. .....Treatise on Pedagogy .....Am. Book Co.
Hughes, J. L.....Froebel's Educational Laws for All Teachers.....D. Appleton & Co.
Hughes, J. L.....Dickens as an Educator. ....D. Appleton & Co.
Hewett, E. C.....Elements of Psychology.....Am. Book Co.
Ham, C. H.....Mind and Hand.....Am. Book Co.
Hinsdale, B. A.....How to Study and Teach Hist. D. Appleton & Co.
Hinsdale, B. A..... Art of Study .....Am. Book Co.
Seerley and Parish..Hist. and Civil Gov't of Iowa. Werner.
Sabin, Henry .....History of Iowa.....Flanagan.

Stevens, C. E. .....Sources of the Constitution of U. S. .....Macmillan.
Townsend, Calvin...Shorter Course in Civil Gov't.Iveson, Blakeman, Taylor & Co.
Wilson, Widrow.....The State and Congressional Government.. .....D. C. Heath & Co.
Warner, A. G.....Am. Charities.....T. Y. Crowell & Co.
Young, A. W. .....The Gov't Class Book.....Maynard, Merrill & Co.

ECONOMICS.

Bley, M. T.....Descriptive Economics.....William & Rogers.
Bullock, C. J. .....Introduction to the Study of Political Economy. .....Silver, Burdette & Co.
Clark, J. B.... .....Philosophy of Wealth.....Henry Holt & Co.
Clark, J. B.... .....Trusts .....T. Y. Crowell & Co.
Cunningham & McArthur ..... English Industrial Hist.....Macmillan.
Cheyney, Ed. P.....Industrial and Social History of England ....Macmillan.
Chapin, A. L.....First Principles of Pol. Ec....Sheldon & Co.
Clow, F. F.....Introduction to the Study of Commerce.. .....Silver, Burdette & Co.
Cunningham, W.....The Use and Abuse of Money.Scribner.
Davenport, W. J ....Elementary Economics.....Macmillan.
Davenport, H. J ....Outlines of Economic Theory.Macmillan.
Dyer, Henry.... ....The Evolution of Industry....Macmillan.
Davidson, John.... .The Bargain Theory of Wages.Putnams.
Ely, R. T.....Outlines of Economics.....Macmillan.
Ely, R. T.....Monopolies and Trusts.....Macmillan.
Ely, R. T.....Problems of To-day.....T. Y. Crowell & Co.
Gibbons, H. De B..Industrial Hist. of Eng.....Macmillan.
Hadley, A. P. . ....Economics .....Putnams.
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Laughlin, J. L .....Elements of Political Economy.Am. Book Co.
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Laughlin, J. L.....Hist of Bimetallism in U. S..D. Appleton & Co.
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Murphy, D. C .....Turning Points in Teaching..A. Flanagan Co.
Mann, Horace ..... Lectures and Annual Reports.Cambridge, Mass.

McGovern, Anna E..Nature Study and Related Literature.....Cedar Rapids Pub. Co.
McMurray, Chas. A.General Method.....Ed. Pub. Co.
Parker, F. W.....Talks on Pedagogy.....A. Flanagan Co.
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Putnam, D.....A Manual of Pedagogy.....Silver, Burdette Co.
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Woodward, C. I.....Manual Training School.....D. C. Heath & Co.
Wray, Angelina W..Jean Mitchell's School.....Pub. School Co.
White, A. D.....Methods of Teaching History.D. C. Heath & Co.

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